

MAY 7, 1942

The

IRON AGE

MAY 8 1942

Thomas Strip

ELECTRO-COATED COLD ROLLED
STRIP STEEL

THOMAS AIDS PRODUCTION OF MANY VICTORY PRODUCTS

During the past decade, Thomas has developed many electro-coated finishes for Thomastrip. When compared with pure metal, electro-coated Thomastrip uses only a small percentage of the non-ferrous materials. These finishes have been used in place of pure metals successfully in many instances. The coatings will not crack or peel. Investigate their production possibilities, deliveries, savings in vital metals, and economies on your war products. Our engineers will gladly co-operate with you. Write today.

THOMASTRIP IS
AVAILABLE IN
BRIGHT FINISH NOT
COATED, HOT TIN
COATED, ELECTRO
COATED WITH NICKEL,
ZINC, COPPER, BRASS

THE THOMAS STEEL CO. — WARREN, OHIO

Every day of every year...
this manufacturer *Dishes*
it Out to his **Clevelands!**



Here's a job that dishes out nothing but punishment to its speed reducers all the time—a job that Cleveland Units have licked consistently since 1929.

The largest Manufacturer in his Industry—now fully engaged in War production—has more than 100 Cleveland Worm Gear Speed Reducers that have never let him down.

His statement "Clevelands help us avoid

shutdowns" is an extra-fine tribute—

For not only must he run his plants day and night, but must keep each machine working continuously.

Even a brief shutdown could stop operation for weeks!

Put your peak loads on Clevelands. They can "take it!"

The Cleveland Worm & Gear Company,
3252 East 80th Street, Cleveland, Ohio.

Affiliate: The Farval Corporation, Cleveland, Manufacturers of Centralized Systems of Lubrication
In Canada: PEACOCK BROTHERS LIMITED

CLEVELAND

WORM GEAR

Speed Reducers

MAY 7, 1942

VOL. 149, NO. 19



J. H. VAN DEVENTER
President and Editor

C. S. BAUR
Vice-President and General Manager

Managing Editor, T. W. LIPPERT
News & Markets Editor, J. A. ROWAN
Technical Editor, F. J. OLIVER

Associate Editors

D. R. JAMES
W. A. PHAIR T. E. LLOYD
Art Editor, F. J. WINTERS

Editorial Assistants

M. M. SCHIEN G. B. WILLIAMS
J. I. BUTZNER S. H. BARMASEL

Washington Editor

L. W. MOFFETT

Resident District Editors

T. C. CAMPBELL HERMAN L. KLEIN
Pittsburgh Chicago
B. W. CORRADO W. F. SHERMAN
Cleveland Detroit

CHARLES POST
San Francisco

Editorial Correspondents

W. P. DEARING ROBERT G. MCINTOSH
Buffalo Cincinnati
G. FRAZAR R. RAYMOND KAY
Boston Los Angeles
HUGH SHARP JOHN C. McCUNE
Milwaukee Birmingham
F. SANDERSON ROY M. EDMONDS
Toronto, Ontario St. Louis
C. H. BACON
Seattle

A. H. DIX, Manager Reader Service

Advertising Staff

Emerson Findley } 621 Union Bldg., Cleveland
Robert F. Blair }
B. L. Herman, Chilton Bldg., Philadelphia
H. K. Hottenstein, 1012 Otis Bldg., Chicago
R. Raymond Kay, 2420 Cheremoya Ave., Los Angeles, Cal.
H. E. Leonard, 100 East 42nd St., New York
Peirce Lewis, 7310 Woodward Ave., Detroit
C. H. Ober, 100 East 42nd St., New York
W. B. Robinson 428 Park Bldg., Pittsburgh
W. J. Fitzgerald
D. C. Warren, P. O. Box 81, Hartford, Conn.
O. L. Johnson, Market Research Mgr.
B. H. Hayes, Production Manager.
R. E. Baur, Typography and Layout.

Member, Audit Bureau of Circulations
Member, Associated Business Papers
Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price North America, South America and U. S. Possessions, \$8; Foreign, \$15 a year. Single copy, 35 cents.
Cable Address "Ironage N. Y."

Owned and Published by
CHILTON COMPANY
(Incorporated)

Executive Offices Editorial and Advertising Offices
Chestnut and 56th Sts. 100 East 42nd St.
Philadelphia, Pa. New York, N. Y.
U.S.A. U.S.A.

OFFICERS AND DIRECTORS
C. A. MUSSELMAN, President

JOS. S. HILDRETH, Vice-President
GEORGE H. GRIFFITHS, Vice-President
EVERIT B. TERHUNE, Vice-President
J. H. VAN DEVENTER, Vice-President
C. S. BAUR, Vice-President
WILLIAM A. BARBER, Treasurer
JOHN BLAIR MOFFETT, Secretary
JULIAN CHASE, THOMAS L. KANE,
G. C. BUZBY, P. M. FAHRENDORF,
HARRY V. DUFFY CHARLES J. HEALE

This Week in . . .

THE IRON AGE

Editorial

Observations of a Traveling Editor 55

Technical Articles

Bolts—Material, Heat Treatment, Physical Properties . . . 57
Steel Castings by the Triplex Method 61
Single-Bladed Carbide Milling Cutter 63
New Drawing Compound for Nickel Alloys 63
From Locomotives to Tanks 64
Nickel Plating Magnesium Alloys 68
Decarburization Depth in Carbon Tool Steel 68
"Sewing" Alclad Aluminum 69
Colloidal Graphite Cuts Assembly Time 71
Micro and Macro Structures of Gray Iron 72
Lockheed Speeds Press Work 75
Novel Cold Reducing Mill 76
Large Electrodes Speed Up Arc Welding 78
What's New in Material Handling Equipment 79

Features

Assembly Line 86
Washington 90
West Coast 94
Fatigue Cracks 98
Dear Editor 100

News and Markets

This Industrial Week 102
News of Industry 105
Personals and Obituaries 167
Machine Tool Activity 170
Non-Ferrous Metals 171
Scrap Markets 172
Iron and Steel Scrap Prices 174
Comparison of Prices 175
Finished Steel Prices 176
Warehouse Prices 178

Products Advertised 220
Index to Advertisers 269

Copyright, 1942, by Chilton Company (Inc.)





**Through Peace and War —
A Century of Service —**

THROUGH 100 YEARS of peace and war—
good times and bad—Ryerson has served
industrial America. As in every other crisis,
we continue to provide steel to meet the
emergency requirements of our nation at war.

JOSEPH T. RYERSON & SON, INC. • CHICAGO • MILWAUKEE • DETROIT • ST. LOUIS • BOSTON • BUFFALO • CINCINNATI • CLEVELAND • JERSEY CITY • PHILADELPHIA

THE IRON AGE

• •
MAY 7, 1942

• •
ESTABLISHED 1855



Observations of a Traveling Editor

FOR some 30 years I have been a "sidewalk superintendent."

A "sidewalk superintendent" is a person who peeks through knotholes and watches other people work. This has become such a popular avocation that construction companies that surround their building projects with tall board fences, now bore holes in them at convenient heights to accommodate the "kibitzers."

In the field of industrial journalism, peering through knotholes is a vocation and not an avocation. And during the past 30 years of watching the metal working industry at work, I have observed many accomplishments that are sufficiently noteworthy to call for printing ink.

I have seen little companies grow into big ones due to their painstaking and able making and selling of a good and needed product. I have seen vacant land, over a period of years, become the sites of busy factories. I have seen whole industries start from a small beginning and in these 30 years, become industrial giants that have amazed and startled the world. And perhaps most gratifying of all, I have seen how universally the men of industry have been able to increase their stature in response to the coming of opportunity and the growth of responsibility.

Two years ago, I would have said that I had about seen the maximum of effort and accomplishment. But now I know that I had, up to then, seen comparatively little.

What I have seen in our industry and of our industry during the past two years, and particularly during the past few months, has been so astonishing as to be almost unbelievable.

I have seen new construction undertaken, plants built or enlarged, output transformed, capacity multiplied, new industries created on such a scale as to challenge the imagination of the author of the Arabian Nights.

I have seen industrial America awaken, with all America, to the bugle call of war after our 25-year dream of peace and put on its armor and armament.

What is now taking place in our metal working industry is so great and vast and astonishing as to be inexpressible. It leaves no doubt whatever in my mind as to the outcome of this war.

When this hurricane of American industrial output, now pouring from our plants and factories, is made effective on the battle fronts—and it soon will be—our adversaries will be crushed under such an intensity of mechanized might as no man has yet experienced and few men have dreamed of.

And to me the prospect is doubly pleasing for it spells the vindication of our American system of enterprise as well as the destruction of the Axis. For if this system of ours is strong enough to win the war, it is strong enough to win the peace to follow.

These Plants Want War Work

So many manufacturers have indicated they have available capacity and are anxious for war work that we have asked them to prepare brief outlines of their facilities, which are listed below. We are most anxious to help place these companies in contact with overloaded "prime" contractors or Government agencies in order that America will quickly attain maximum

war production. If you have war work to place, wire or write us and we will give you the names and addresses of any of the companies in which you are interested. Even if the type of plant you need is not listed, it may pay you to get in touch with us because we have and are continuing to assemble information on additional plants.

IS-11 Capacity of three large plants in the Middle West, 1,000 emp. For production of 10-24 gage steel products including shearing, forming, stamping, drawing, welding, riveting, dip and spray painting and electro-galvanizing. Adequate capital and highest credit rating.

IS-12 Large Ill. concern, 36 yrs. mfg. machinery equipment, 20,000 sq. ft. of mfg. space with approx. 100,000 sq. ft. for storage. Slab milling machine, gear shaper for internal and external spur cutting, engine and spindle lathes, vertical boring mill, gear hobber, milling machine, sensitive, radial and vertical power drills, tapping machine, planers, cutting saws and electric welding machines. Have 38 men on three shifts, also training classes. Interested principally in war work sub-contracts for medium size parts.

IS-13 Ohio mfr. of decorated metal dry package cans, signs and displays. Two plants, fl. space 370,000 sq. ft.; employ 250. Dry package assembly line from 1½" to 16" diameter. Automatic and hand-fed punch presses, complete decorating and baking equipment, with facilities for coating and baking sheet metal. Lithographing, engraving and screen processes.

IS-14 Large Mid-west spring bed mfr. in fireproof building with over 40,000 sq. ft. fl. space, located on railroad siding. Plant includes a full line of punch presses, coiling machines and various other equipment used in making bed springs. Have coilers for making special springs for aviation industry. Also two shapers, two lathes, milling machine, drill press, grinders, heat treating facilities and misc. machine shop equipment.

IS-15 Long established Mo. fabricator heavy sheet metal, light plate and structurals. Equipment includes 10 ft. and 12 ft. press brakes, gate shears, 10 ft. rolls (plain and corrugated), punch and drill presses, welding and gas cutting equipment, many years experience in Government work and currently occupied on sub-contract basis. Working one shift only.

IS-16 Thirty-year-old nationally known Mo. mfr. employing 250 including approximately 36 men on eng. staff, has 75,000 sq. ft. of floor space for seven day week operation. Equipped to form standard and special shapes from sheet steel, channels, angles and Z-bars. Complete machine and welding shop.

IS-17 Large steel furniture mfr. in Ill., located on two railroad sidings. Plant fl. space over 100,000 sq. ft., employs 150 to 200 men on one shift. Complete facilities for handling up to 14 gage steel sheets, steel stampings, light gage tubular and angle iron fabrication. All types of finishes, including solid colors and wood grains. Plant has complete machine and paint shops with ample capacity of punch and drill presses, benders, lathes, grinders and shears, hand and power brakes and welders. Have successfully completed great variety of war work contracts.

IS-18 Middle West stove concern, approx. 200,000 sq. ft. working space with complete equipment for stampings, spot welding, drilling, brazing, and assembly of parts, including finishing bake ovens.

IS-19 Nationally known implement mfr. (Ind.) desiring direct or sub-contract war work, with complete equipment for metal forming and small drop forgings, including punch presses and shears, drop and trip hammers, threaders, forging rolls, double end grinders, eye-benders, bull dozers, lathes, and forging furnaces.

IS-20 Complete fabricating plant in Ohio, 50,000 sq. ft. fl. space, thoroughly experienced in war work, available capacity for sheet metal stampings, light structurals and sheet metal fabrication.

IS-21 Ohio mfr. having 66,000 sq. ft. of available plant floor space and 85 employees desires war contracts. Plant includes 5 double end punch and shears (200 to 20 tons pressure), 2 single end punch and shears (100 and 78 tons pressure), 2 single end inclinable punch presses (7½ tons pressure), 5 belt-driven drop hammers (1,000 to 90 lb.), 3 bull dozers—24 in. to 16 in. stroke, 4 presses, 3 planers, lathes, drill presses, boring machines, and 7 heating furnaces.

IS-22 Ill. mfr. of range boilers, hot water tanks, 27,000 sq. ft. fl. space, property adjoining available for expansion. Average number of emp. 60. Complete facilities for welding and fabricating 16 ga. to ¼ in. sheet metal. Hand operated and automatic electric welders. Have facilities for galvanizing, kettle size 39 in. by 11 ft. long and 4 ft. deep. Willing to convert plant to war production.

IS-23 Large Mid-west stove mfr. with complete facilities including 300 presses ranging from 400 ton triple-acting hydraulic to small punch presses. All types of spot, seam and portable electric welders, automatic plating, japanning equipment with conveyorized ovens, complete porcelain enameling plants with continuous type furnaces. Grey-iron foundry. Will send experienced engineers to discuss direct or sub-contracts for war work.

IS-24 Large heating, ventilating and air conditioning company in Ill. with complete facilities for welding of all types including electric, oxy-acetylene, stationary and gun type spot welding. Shearing and braking cap. up to 10 gage 10 ft. wide, and machine shop equipment. Up-to-date finishing department and large bake oven. Approx. 100 employees.

IS-25 Modern mfg. plant (Wis.) with complete equipment and trained personnel for fabricating sheet steel products 12-32 gage. Over 750,000 sq. ft. fl. space in well lighted and ventilated brick and steel buildings. Exceptional opportunity for mfg. and assembly lines. Equipment includes 117 punch presses, 50 shears, hammers, drills, lathes, welders and complete machine shop. Sub-contract business given careful attention by war contract division of this company.

IS-26 Ind. sheet metal manufacturer with 800 employees and 450,000 square feet of plant floor space has 7 air presses, 4 double action presses, 1 hydraulic press, 12 blanking presses, and 13 small punch presses. Complete welding and painting equipment and all types of assembly. Have been making bottle coolers, sinks, cabinets, automobile and jeep bodies.

IS-27 Bicycle accessory manufacturer in Ia. Employing 25 (one shift) has available facilities for additional war work including stamping and drawing presses, automatic screw machines, lathes, drill presses, welders, shapers, grinders, benders, and riveting machines. Complete Cadmium plating plant. One story fire-proof building 66' by 132', steam heated, glass enclosed. Located in wholesale manufacturing district.

Write or wire for names and addresses of companies.

*Dedicated
to Victory*

INLAND STEEL CO.

18 S. Dearborn Street, Chicago

Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City, Cincinnati, New York

BOLTS

—Material, Heat Treatment and Physical Properties

BOLTS, from an engineering standpoint, are fastening devices, and steels used for fastening devices are those which must have at least a moderate degree of plasticity. Plasticity is desirable because if an unusual load is applied tending to disconnect the two members held together by the fastening device, it is better that their severance be gradual rather than sudden. This being the case, bolts are rarely made from high carbon steel but usually from low and medium carbon steels, heat treated to produce plasticity.

In earlier days, bolt heads were forged. Later this developed into more elaborate machinery for hot heading, increasing considerably the rate of production. The highest degree of development of this hot forming method is a machine that heads and roll-threads the heated blank in one cycle. Hot formed bolts are also made from

... A critical analysis of carbon and alloy steel cold formed bolts and carbon steel hot formed bolts is given herein. Herein, part one of a two part series, covers cold formed, low and medium carbon steel bolts.

By A. S. JAMESON

Metallurgist, International Harvester Co.,
Chicago

material receiving no further heat treatment. The most obvious way to increase the strength of a hot formed bolt is to increase the carbon content and secondly the manganese content of the material. Table I shows typical hot formed

bolt materials and their approximate tensile properties.

It must be said in connection with Table I that the physical properties of these materials will vary considerably, depending upon their austenitic grain size and the

TABLE I
Typical Hot Formed Bolt Materials* and Approximate Tensile Properties

Type of Steel	A.I.S.I. Classification	Chemical Composition					Physical Properties in Tension				Hardness, Rockwell "B"
		C	Mn	S	P	Si	Yield Point, Lb. Per Sq. In.	Tensile Strength, Lb. Per Sq. In.	Elongation in 2 In., Per Cent	Reduction of Area, Per Cent	
Low carbon	C-1017	0.19	0.54	0.023	0.009	0.19	32,000	61,000	38	62	61
	C-1018	0.17	0.81	0.032	0.016	0.20	37,000	65,000	37	68	67
Sulphurized carbon	C-1116	0.21	0.78	0.102	0.011	0.04	42,000	67,000	38	62	67
	Bessemer	0.11	0.84	0.187	0.107	0.01	48,000	68,000	35	59	70
	C-1117	0.24	1.32	0.170	0.015	0.01	49,000	73,000	33	54	69
Medium carbon	C-1038	0.35	0.71	0.029	0.012	0.20	48,000	68,000	30	51	75
	C-1045	0.44	0.70	0.017	0.019	0.23	53,000	86,000	26	45	79
Sulphurized carbon	C-1137	0.37	1.48	0.106	0.019	0.05	57,000	99,000	27	48	88

* Standard ASTM 0.500 in. Test Bars

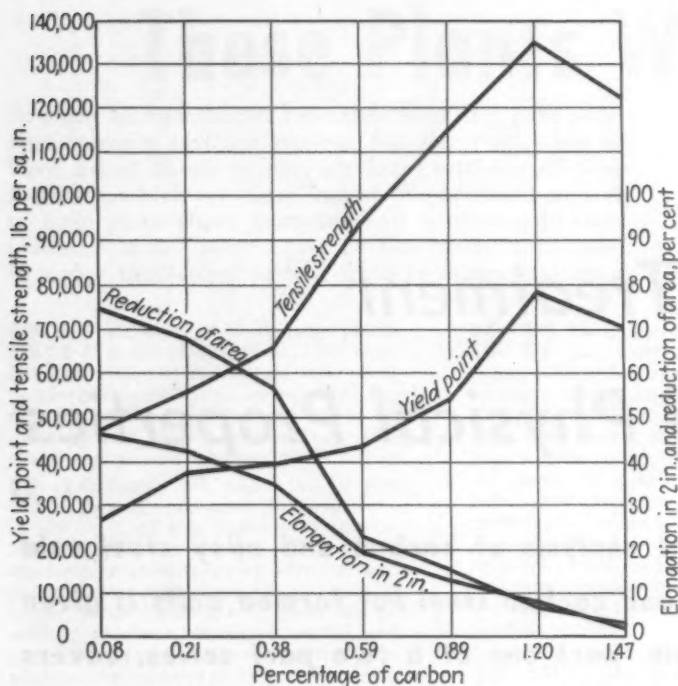


FIG. 1 — The physical properties of bolt steels plotted against the carbon content.

cooling rates employed after hot heading. However, using the yield point deemed to be the most important property in this type of bolt, it will be noted that:

(1) With the low carbon steels, C-1017 vs. C-1018, a 27-point increase in manganese content increased the yield point 5000 lb. per sq. in.

(2) The bessemer steel, B-1112, had a yield point 6000 lb. per sq. in. higher than the equivalent sulphurized carbon steel, C-1116.

(3) With sulphurized steels, C-1116 and C-1117, the increase of

54 points in manganese in the C-1117 steel increased the yield point 6000 lb. per sq. in.

(4) With the medium carbon steels, C-1038 and C-1041, a 9-point carbon increase raised the yield point 5000 lb. per sq. in., while between the low and medium carbon steels, C-1018 and C-1038, an 18-point increase in carbon increased the yield point 11,000 lb. per sq. in.

Data by Edwards showing the effect of increasing carbon and manganese contents on the tensile strength of steel are given in Figs. 1 and 2.

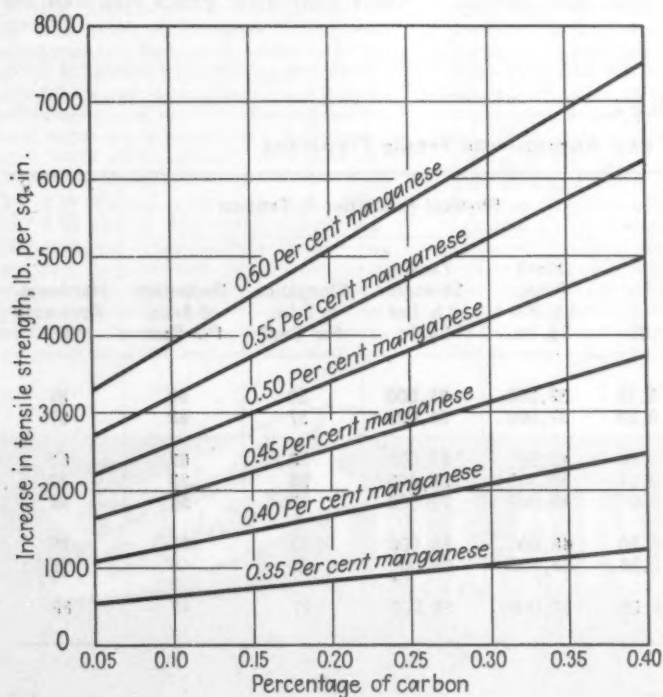


FIG. 2 — The increase in the tensile strength of various steels due to the addition of manganese to various carbon steels.

The additions of carbon and manganese would cease when such additions reduced the plasticity of the bolts to an unsafe limit. In practice, however, the limitations would be governed by the ease with which the bolt could be threaded. It should be understood that the majority of hot headed bolts are cut threaded in the cold state. Because of this, sulphurized steels, which are relatively easily threaded, are used for hot headed bolts. The stock for hot headed bolts is purchased as hot rolled bolt rounds, held to close outside diameter limits with tolerances on the minus side. This is done to insure the correct basic major diameter of the thread.

Cold Formed Bolts

The most popular method of manufacturing bolts is cold heading, the material used being in the form of cold drawn wire. A discussion of the material can be conveniently divided into two sections, namely low carbon and medium carbon.

The advantages of using a low carbon steel are that the initial cost of the material, and the cost of heading, trimming, and threading, are considerably less. The disadvantage is that the tensile strength is not as great as can be obtained from a medium carbon steel heat treated.

A basic open hearth, semi-killed steel conforming to the American Iron & Steel Institute's C-1018 specification of the following analysis is the most commonly used:

Carbon = 0.15 to 0.20 per cent
Sulphur = 0.050 per cent maximum
Manganese = 0.60 to 0.80 per cent
Phosphorus = 0.040 per cent maximum

In the utilization of this material, the basic principle is one of retaining the high tensile strength of the cold drawn wire. The effect of cold drawing on the physical properties of 0.27 carbon steel is illustrated in Fig. 3.

The limitations placed on using wire drawing as a means of increasing bolt strength is that sufficient plasticity must be retained in the wire so that it can be used in the cold heading operation. Therefore, for all practical purposes one draft is all that can be employed. To properly employ this principle of retaining the effect of the cold working, a maximum and

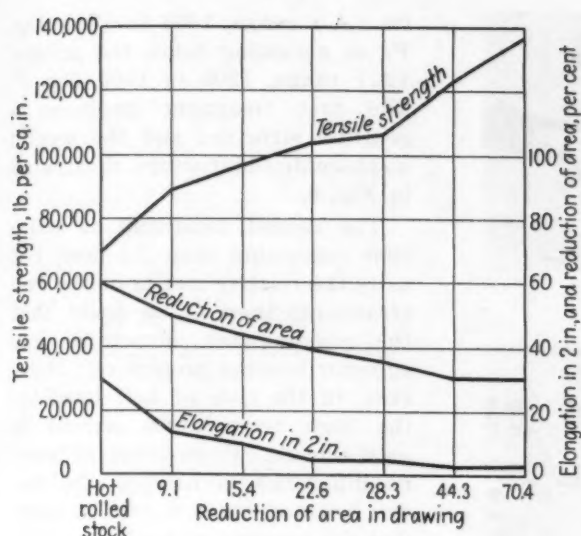


FIG. 3—The effect of cold drawing on the tensile properties of 0.27 per cent carbon steel.

minimum tensile strength specification limit must be placed on the wire. A specification now in use reads:

Tensile Strength, Lb. Per Sq. In.		Elongation in 2 in., Per Cent (Minimum)	Reduction of Area, Per Cent (Minimum)
(Min.)	(Max.)		
70,000	90,000	15.0	50.0

After cold heading, the bolts are given a process anneal to return some degree of plasticity to the highly cold worked head of the bolt. The threaded section of the bolt, which represents its tensile strength, is also somewhat reduced by this process anneal. An illustration of the process from the physical standpoint is shown in Fig. 4. Microscopically, re-crystallization is visible when cold formed bolts are process annealed at 1000 deg. F. A complete illustration of

the effect of annealing on an 0.18 per cent carbon steel, cold reduced 75 per cent in one dimension, is shown in Fig. 5.

The statement that a process anneal is necessary to restore plasticity to the cold worked head of the bolt is subject to modification to the extent that if special precautions are taken, such as using a heavier gage wire and later extruding the bolt blank in the threaded section, a process anneal may not be necessary. Thus, a bolt having a tensile strength of 100,000 lb. per sq. in. may be produced by cold work and safely used.

Medium Carbon Bolts

For clarity of presentation, the medium carbon bolts can further be broken down in carbon steel and alloy steel bolts. The essential difference is that in the more popular bolt $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ and $\frac{5}{8}$ -in. sizes, a

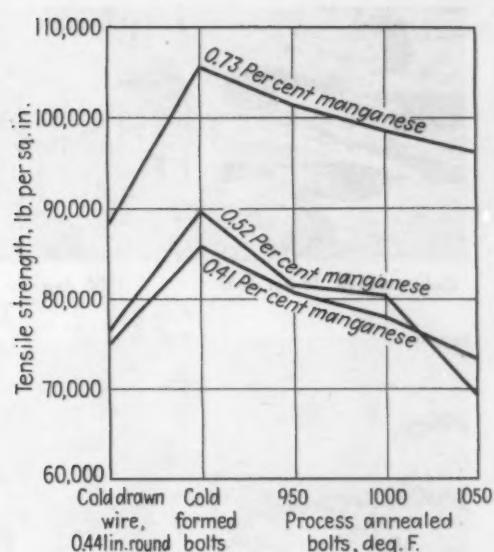


FIG. 4—The tensile strength of cold headed and process annealed $\frac{1}{2}$ and 1-in. National Coarse bolts, containing 0.17 per cent carbon.

carbon steel does not have the hardness penetration to produce a completely hardened section in the bolt. Thus, bolts made from carbon steel do not have a high tensile value for the same surface hardness. It might be suggested that a more severe quench might be used. This, however, so often results in cracking of the bolts that for all practical purposes, it is undesirable to aim at producing maximum hardness penetration by this means.

The most used analysis of carbon steel for bolts is: Carbon, 0.30 to 0.45 per cent; manganese 0.60 to 0.90 per cent, and silicon 0.10 to 0.30 per cent. There is no unanimity in a matter of carbon ranges within the 15 points quenching mediums or austenitic grain size specifications. For the purpose of discussion, the practice of one manufacturer will be used. With this manufacturer there are two

TABLE II
Chemical and Austenitic Grain Size Specifications of Carbon Steel Bolts

Wire Diameter, In.	Bolt Size, In.	Carbon		Manganese		Silicon		Austenitic Grain Size, McQuaid-Ehn, In.	Quenching Medium	A.I.S.I. Classification
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum			
Over 0.430	$\frac{1}{2}$ to $\frac{3}{4}$	0.32	0.38	0.60	0.90	0.15	0.30	5 to 8	water	C-1034
0.430 and under	$\frac{1}{4}$ to $\frac{7}{16}$	0.35	0.42	0.60	0.90	0.15	0.30	1 to 4	oil	C-1038

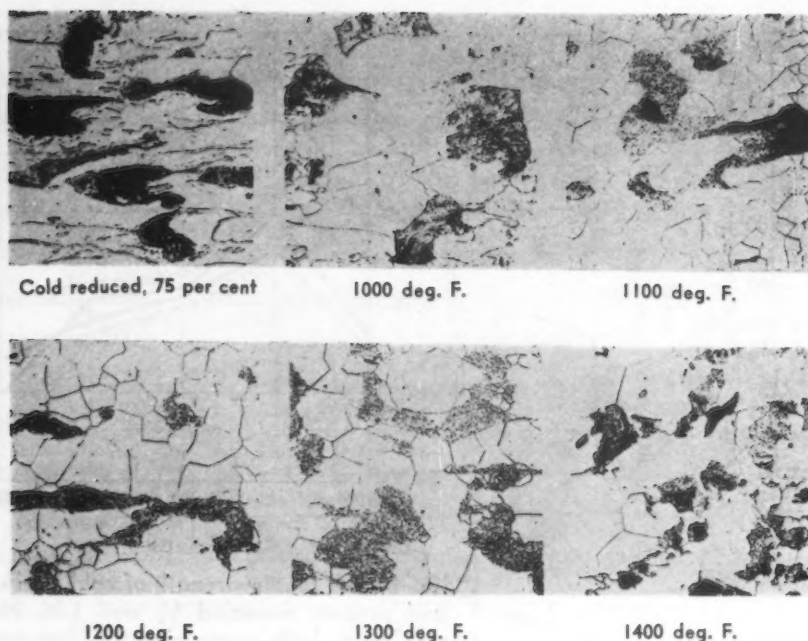


FIG. 5—The effect of process annealing 0.18 per cent carbon steel, cold reduced, 75 per cent, at various predetermined temperatures. Nital etched and magnified 300 diameters.

specifications set up: One for water quenching and one for oil quenching. The use of these quenching media is based on size, illustrated in Table II.

Wire is purchased in the form of cold drawn wire to a diameter tolerance of ± 0.002 in., the tolerance within any one coil being within a total of 0.001 in. These desirable conditions are obtained by drawing through carbide dies. The wire size tolerance is quite important with this material as the life of heading dies is more important than it is in the cold heading of a low carbon steel wire. Die life of 1,000,000 pieces per solid

die is not uncommon using low carbon wire, whereas 250,000-pieces is quite good using a medium carbon steel wire.

To produce good die life, the finish on the medium carbon wire is also important. Finishes are usually produced by pickling, rusting and drawing with aluminum stearate or some other similar acting material. The die life can be increased by 50 per cent when careful attention is paid to the wire finish. To maintain good die life and further to insure uniform heading properties, medium carbon steel wire is treated before cold drawing by either annealing above the criti-

cal (A_c) range, 1650 to 1700 deg. F., or annealing below the critical (A_c) range, 1200 to 1300 deg. F. The first treatment produces a pearlitic structure and the second a spheroidized structure, illustrated in Fig. 6.

The second treatment is more time consuming than the first, but as to the relative merits of the two treatments there is no doubt that the spheroidized structure has superior heading properties. However, in the case of bolt heading, the high temperature anneal is good enough. From frequent tests, no difference in heading die life was detected, but it is said by some that the response to heat treatment is different. Again, from many tests, it has been concluded that no practical difference is encountered.

The microstructure of the bolt wire will naturally affect its physical properties. The wire is usually purchased to a maximum tensile requirement and a minimum elongation or reduction of area requirement. A typical requirement is as follows:

Wire Diameter, In.	Tensile Strength, Lb. Per Sq. In. (Maximum)	Reduction of Area, Per Cent (Minimum)	Hardness Rockwell "B" (Maximum)
Over 0.430	105,000	35	90
Under 0.430	115,000	35	95

Editor's Note: Next week the author will conclude this discussion on bolt steels, dealing with heat treating carbon steel bolts, and the use of alloy steels in the manufacture of bolts.

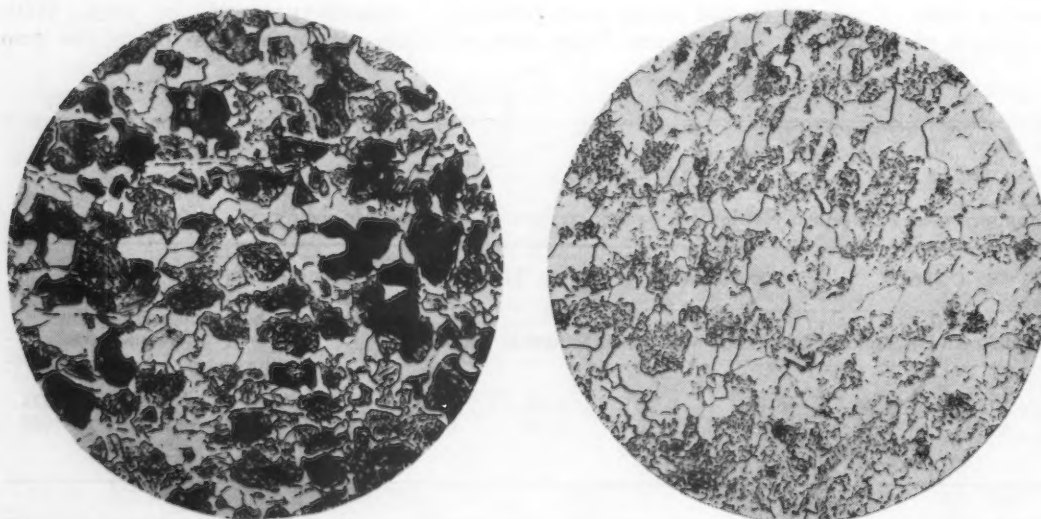


FIG. 6—Annealing above the critical range (1680 deg. F.) produces the pearlitic microstructure similar to that shown at left, while annealing below the A_c range (1300 deg. F.) produced the spheroidized structure on the right. The etchant used was nital, and magnification was 300 diameters.

Steel Castings

by the

Triplex Method

By A. W. GREGG

Executive Engineer, Whiting Corp.,
Harvey, Ill.

THE triplex method for the continuous production of steel castings is a relatively new development that holds great promise for the steel casting industry. This method involves the use of the cupola, the converter and the electric furnace (see Fig. 1), hence the designation "triplex." The development of this process was the result of a demand for metal lower in carbon than could be produced with the cupola. No matter what material is charged into a cupola, it is very difficult to obtain a carbon content much below 2.75 per cent.

When the demand arose for lower carbons, and this was especially the case in connection with so-called copper-silicon steel having a carbon content of 1.50 per cent, the method adopted was to mix cupola metal containing about 3 per cent C with blown metal containing about 0.05 per cent. These two metals, mixed in a proportion to give the desired carbon, were transferred to an electric furnace for distribution to molds produced on a traveling conveyor.

When the large demand for steel castings developed as a result of the war effort, this method was modified to produce steel with carbon ranging from 0.25 to 0.50 per cent. This composition was obtained by blending converter metal with cupola metal in suitable proportions to arrive at the desired percentage of carbon.

When producing steel by the triplex method, the cupola charge usually consists of steel scrap, plus silicon-bearing material, such as

... Use of the triplex method, which combines the cupola, the converter and the electric furnace, for producing steel with a carbon content lower than that obtainable by use of the cupola alone, is described in this article.

50 per cent ferro-silicon, silicon briquettes or silvery pig iron. The temperature of the converter steel is controlled by the percentage of silicon in the cupola metal. With 2 per cent Si in the cupola metal, the converter metal will have a temperature of 3000 deg. F. or more. Cupola metal is desulphurized in the ladle prior to blowing, and with proper procedure and the correct amount of alkaline material, sulphur can be readily held in a range of 0.25 to 0.04 per cent.

Ordinarily the steel is deoxidized and recarburized by additions of cupola metal, ferro-manganese, ferro-silicon and aluminum, before it is delivered to the electric furnace. The electric furnace in this case operates as a heated distributing unit and power consumption is very low as the metal is practically finished before delivery to the electric furnace.

It is customary to adjust composition and temperature in the electric furnace and if alloys are required, it is convenient to add them here. It is desirable to have about a half hour's supply of steel in the electric furnace at all times. When this process was first put into operation, some difficulty was experienced in maintaining a neu-

tral non-oxidizing slag, which is highly essential, because an oxidizing slag will result in a loss of carbon, silicon and manganese.

C Content Check

Carbon composition is regularly checked on samples taken from the electric furnace each time a converter heat is added. This is done conveniently with a Carbometer or a Carb-analyzer.

The automotive gray iron foundries for many years have used continuous methods of molding, pouring, etc. Molds are made on machines and placed on a moving conveyor and while on the conveyor cores are set, molds are closed and poured, cooled and finally delivered to a shake-out machine.

Obviously a continuous production and pouring scheme presupposes a continuous supply of molten metal. For gray iron, the cupola furnace supplied this need admirably because it is a continuous melter. The melting rate can be synchronized with the metal required at the mold conveyor to a very exacting degree. Continuous operation makes possible very large economies in floor space and labor, and this system has been generally adopted by all gray iron foundries

producing large tonnages of long-run castings.

The benefits of continuous operation have not been available to manufacturers of steel castings, primarily for want of a continuous supply of molten steel. The operating cycles for open hearth and electric furnaces range from 2 to 6 or more hours, and even by the converter process (which has a 20-min. cycle) the demand for continuous steel is not fulfilled.

The war demand for steel castings has been conservatively estimated as being three times greater

proved the triplex process for the production of all types of ordnance castings.

Physical Properties

Typical physical properties of steel produced by this process are as follows:

Tensile strength, per sq. in. = 80,000 to 85,000 lb.

Yield point, per sq. in. = 42,000 to 48,000 lb.

Elongation in 2 in. = 25 to 30 per cent.

Reduction of area = $42\frac{1}{2}$ to $52\frac{1}{2}$ per cent.

any desired amount of phosphorus (up to 70 per cent) is readily accomplished. The metal, after this treatment, is in a highly oxidized condition and requires treatment in the electric furnace, either acid or basic lined, to remove excess oxygen.

**See THE IRON AGE, Oct. 31, 1940, p. 52. Also, see "Rapid Metallurgy in War Production," THE IRON AGE, April 23.*

(3) If the Yocom method is adopted for phosphorus removal and the metal transferred to a basic electric furnace, it will be possible

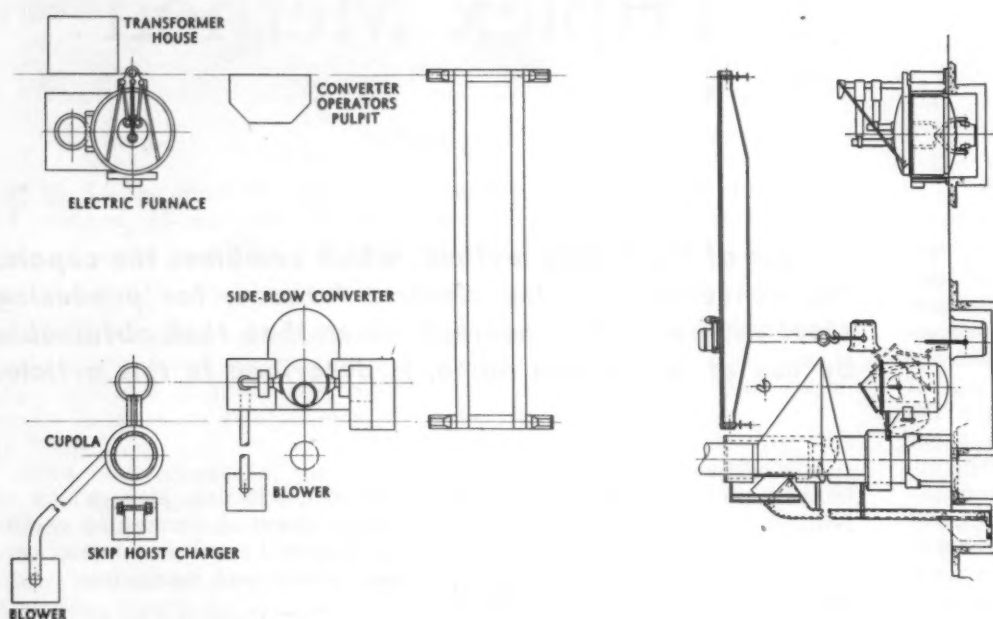


FIG. 1 — Typical layout of the various units required to produce steel for castings by the triplex method.

than present capacity. It would seem that the simplest and most readily available method to increase electric furnace capacity would be to adopt the triplex method by installing cupolas and converters to supply molten steel to the electric furnaces.

This would have the additional advantage of flexibility and, under some circumstances, it might be practical to shut down the electric furnaces and use straight converter steel. This might very well happen when the war demand for large tonnages comes to an end.

At the present time converter steel has not been approved for ordnance castings made under Specification QQS-681-b, although several well known foundries have been making ordnance castings under Specification QQS-681-a (a more difficult specification), and meeting all requirements, both chemical and physical. The Ordnance Department recently has ap-

Cold bend = 140 deg. to 180 deg.

There are several variations of the triplex process which may be worthy of consideration:

(1) If the converter is installed in connection with basic-lined electric furnaces, it is possible to use practically any kind of charging material, even cast iron. The cupola metal would then be desulphurized in the ladle prior to blowing, and the blown metal would be dephosphorized in the basic electric furnace. This would make available high phosphorus material which at present is not usable by any acid steel-making process.

(2) Another, and perhaps more promising method of operation, involves the use of the dephosphorizing method* developed by Gordon M. Yocom of Wheeling Steel Corp. In this method, converter steel, after blowing, is dephosphorized in the ladle by treatment with a combination of lime, fluorspar and mill scale. In this way the removal of

to operate with a single slag, whereby sulphur will be removed, making it unnecessary to desulphurize the cupola metal prior to the converter operation.

The triplex process has many advantages. There is a large saving in power—the electric furnace when operated as a holding unit, consumes only about 50 to 75 kw.-hr. per ton with acid operation, but considerably higher for basic operation.

Power Needs Reduced

If the Yocom process for dephosphorizing is combined with basic electric operation, the power consumption will be reduced at least 50 per cent by reason of the advantage of operating with only a single desulphurizing slag. Of course, if low-phosphorus material is available, the most economical arrangement for triplexing is to operate both converter and electric furnace with acid lining and use the electric

furnace as a holding or distributing unit only.

At the present time many iron foundries are considering the installation of steel making equipment because of the fact that thus far cast iron has played a relatively small part in the war program. It should be remembered, however, that considerable experience is required for the manufacture of steel castings and that the melting department involves but a small part of the equipment necessary to convert an iron foundry into a steel foundry.

The method of gating and risering for steel castings differs radically from iron practice; the sand for molding and core making must

have a much higher refractory value, and the cleaning department will require much additional equipment. In addition to this, special equipment is required for heat treating and annealing, and last, but not least, a trained metallurgical personnel is imperative for the control of all the steel-making and heat-treating processes.

Some fear has been expressed that the war demand will build up an excessive capacity for steel castings which would be unnecessary and unused after the war demand ceases. Such considerations must be forgotten at the present time, as first interest today is to win the war, and steel castings are one of the vital necessities to supply tank

parts, tank armor, gun carriages and other munitions.

The triplex process, while a recent development, is in successful operation today and under consideration by several important producers. In one case a manufacturer has been able, through the triplex process, to obtain a production four times the normal rated capacity of an electric furnace. Such results certainly warrant careful consideration by steel producers, especially as the triplex process represents a considerably lower investment for new equipment and can be put into operation in a much shorter time than many other methods available for increasing production.

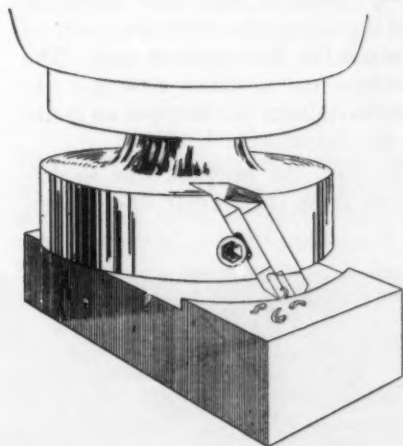
Single-Bladed Carbide Milling Cutter

AT a time when manufacturers of standard milling cutters are unable to keep up with the demand, McKenna Metals Co., Latrobe, Pa., announces a method by which simple facing cutter heads may be made in almost any shop. Due to its high speed of cutting, this single-bladed Kennamill, employing Kennametal tungsten titanium carbide tools, will often work more efficiently than a standard cutter requiring many high speed steel blades.

Designed with a large negative spiral angle of 35 to 55 deg. and positive hook of 15 to 25 deg., this cutter mills steel efficiently because Kennametal does not gall or permit the adherence of steel chips to the hard, strong tool tip which "skids" the steel chip off smoothly at these angles.

For roughing, with cuts up to $\frac{3}{8}$

in. deep, a 35-deg. negative helical angle and 15-deg. positive hook on a 12-in. diameter cutter head has been found to work efficiently. For light finishing cuts a negative



helix of 55 deg. with 20-deg. positive hook angle is most efficient. The hook angle should be less on a smaller diameter head.

Kennametal cutters should be run at 300 to 600 ft. per min. peripheral speed, with a table feed of 0.008 in. per rev., depending on the material being machined. A 6-in. diameter head gives about 3 in. per min. table feed at 380 r.p.m. (600 ft./min. cutting speed). Clearances should be kept to a minimum and only a slight radius used. No coolant should be used as it is impossible to keep the cutting point flooded at the speeds employed.

The Kennametal-tipped blades can be removed from the cutter heads and reground quickly, an important advantage over standard cutters, which require removal of the entire head from the machine, with consequent loss of time.

New Drawing Compound for Nickel Alloys

NICKEL alloys can now be drawn, stamped or formed, and then annealed without cleaning, by using a dispersion of Diglycol Stearate S in water. Diglycol Stearate S, made by Glyco Products Co., 230 King Street, Brooklyn,

is a white wax-like solid dispersible in water, has a melting point of 124 to 129 deg. F. It will fire off completely at a temperature of 400 deg. F. or higher in an atmosphere of oxygen or hydrogen. A concentration of 1 per cent applied as a

spray is usually sufficient as a lubricant for drawing and stamping, though 2 per cent concentrations are sometimes employed. Concentrations of less than 1 per cent can generally be used to replace the sulphonated oils used as lubricants in stamping.

From Locomotives to

TANK production is about as complex a manufacturing job as can be encountered. Containing over 30,000 piece parts, the M-3 medium tank and its successor, the M-4, are highly specialized machines that must be produced to close tolerances on a mass production basis, although tank production did not begin that way. Not the least of the difficulties was that there was very little prior art in this type of heavy machine construction. Yet when the Battle of France demonstrated beyond doubt the importance of the tank in mechanized land warfare, the Ordnance Department of the U. S. Army with the cooperation of the OPM in that fateful June of 1940 sought manufacturers who either had the facilities or the "know how" to produce these mobile forts. In retrospect, it appears now that they worked both ends against the middle.

At that date, a railroad car builder already was making the light tank and steadily increasing its output. It seemed natural therefore that for a heavier vehicle, the War

By FRANK J. OLIVER
Technical Editor, The Iron Age

o o o

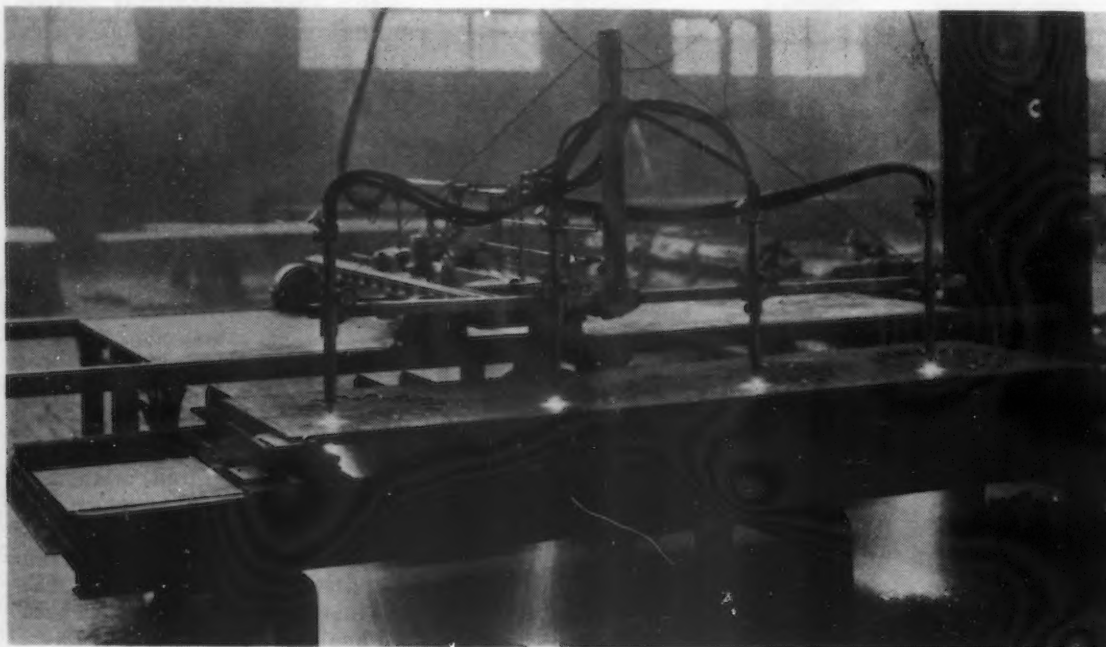
Department and the OPM should turn to the locomotive builders, which were just beginning to show some signs of activity after hibernating through the long, lean depression years. Such manufacturers make a highly specialized machine to close tolerances, but not on a mass production basis. In fact, the reverse condition is true; through a customer policy, practically every locomotive built was a custom job to suit the ideas of a particular railroad. At the same time that contracts were being negotiated with these builders, the OPM turned in the other direction and signed up the Chrysler Corp. to produce the M-3 medium tank. The problem had as many new and unfamiliar slants to Chrysler as it did to the locomotive builders.

In fact, the problem was so different from its regular line of pro-

duction that Chrysler chose to build (at government expense) an entirely new plant and equip it with the latest production machinery. That, of course, was in the days when automotive production was on a "business as usual" basis. It is to the credit of the locomotive builders that they got going quickly on existing equipment, although ultimately they bolstered up these manufacturing facilities with new machine tools as fast as they could be obtained.

Locomotive builders had the "know how," to this important extent—they were experienced in riveting, machining and welding heavy steel plate and steel castings; they had the large, heavy machine tools for big work and equally important, the necessary crane facilities, and they were versatile in handling a wide variety of operations. Furthermore, particularly since the adoption of roller bearings, they were used to working to close tolerances on heavy work—quite a different proposition to hitting close tolerances on light parts. And last-

o o o



TORCH cutting four sprocket gears at a time, the shape being controlled by a template mounted on the table at the rear.

o o o

to Tanks

— A Story of Conversion

PUTTING the finishing touches on an M-3-A1 medium tank at the plant of the American Locomotive Co.*

ly, they are great improvisers as to tooling when the quantities are relatively small and the tolerances relatively tight, considering the size and weight of the work. They had no assembly lines comparable to the power driven ones found in the automotive industry, but the principle of spot or station type assembly is well known to both locomotive and railroad car builders, and this is primarily the type of assembly line found in the modern tank arsenal.

This story concerns itself with the part that the American Locomotive Co. played in this race against time, because it was among the first commercial companies to build a pilot model of the M-3 medium tank and to get into line production of this model. The original tank order, calling for one and a half tanks a day, was given in the form of a letter of intent after a conference with William S. Knudsen, of OPM, in July, 1940. By the time the formal contract was signed with American Locomotive Co. in November, production was already well under way and all the additional machinery had been ordered.

The first pilot tank was completed on April 19, 1941, and two months later these tanks were in regular line production. The program has been greatly expanded since then.

To the American Locomotive Co., even though the contract was on a "cost plus" or free basis, there were some challenging elements present that brought forth the competitive spirit in the operating personnel. From the start, Robert B. McColl, vice-president in charge of manufacturing, set as definite objectives that his company should build the first tank, the best tank and at the least cost. The company knows that it has achieved the first goal, believes it is making the best tank and hopes that by the time cost comparisons are made, it will be shown as making the lowest cost tank. As shall be seen, the latter goal is one that is being constantly striven for.

Long a believer in team work and no "stars," the company immediately set up a 10-man committee,

chairmanned by Mr. McColl. On this committee were members of his general manufacturing staff, such as mechanical superintendent or equipment supervisor, the process engineer, piece work supervisor and some of the divisional superintendents, as well as the manager of the main works.

The committee started to work by spending a week at Rock Island seeing how the M-3's immediate predecessor was being made. These men studied the parts, operations sheets, tooling and actual production, bearing in mind, of course, that the arsenals are primarily experimental production shops and that many methods could be improved upon when the production quantities involved became large enough to warrant more elaborate tooling set-ups.

When the committee got back to the plant, a series of round table conferences began that continued



for three weeks. At these conferences, which often lasted far into the night, many important questions were decided. First of these was what parts of the tank were to be manufactured and what parts were to be subcontracted. At the start, certain items had been designated by the arsenal as "free issue" items, like transmissions, engines, guns (but not gun mounts), track shoes and other specialties for which production had already been arranged by the Ordnance Department. Parts like armor plate, would obviously have to come from a steel mill, but the company had the option of machining the plate edges and drilling the rivet holes or having the job done by the supplier. The locomotive company chose the latter method. Similarly, when the cast steel hulls came into the picture, the company bought these from two suppliers with all the necessary machining operations already performed.

Once the parts that were to be made in the company's own shops were decided upon, it then became necessary for the committee to determine the sequence of operations on each piece, select the equipment on which the operations were to be performed and decide upon the general features of the tooling. To simplify this enormous amount of detail, each member of the committee, during the arsenal visit, had been assigned an assembly unit for which he was to be entirely respon-

AFTER the teeth of the sprockets have been roughed out with automatic cutting tools, they are accurately milled to final shape on this Newton planer-type miller. Thirty blanks are stacked on the holding fixture with mandrel supported on centers in the manner shown. An index plate on the far end of the mandrel governs the spacing between the teeth.

o o o

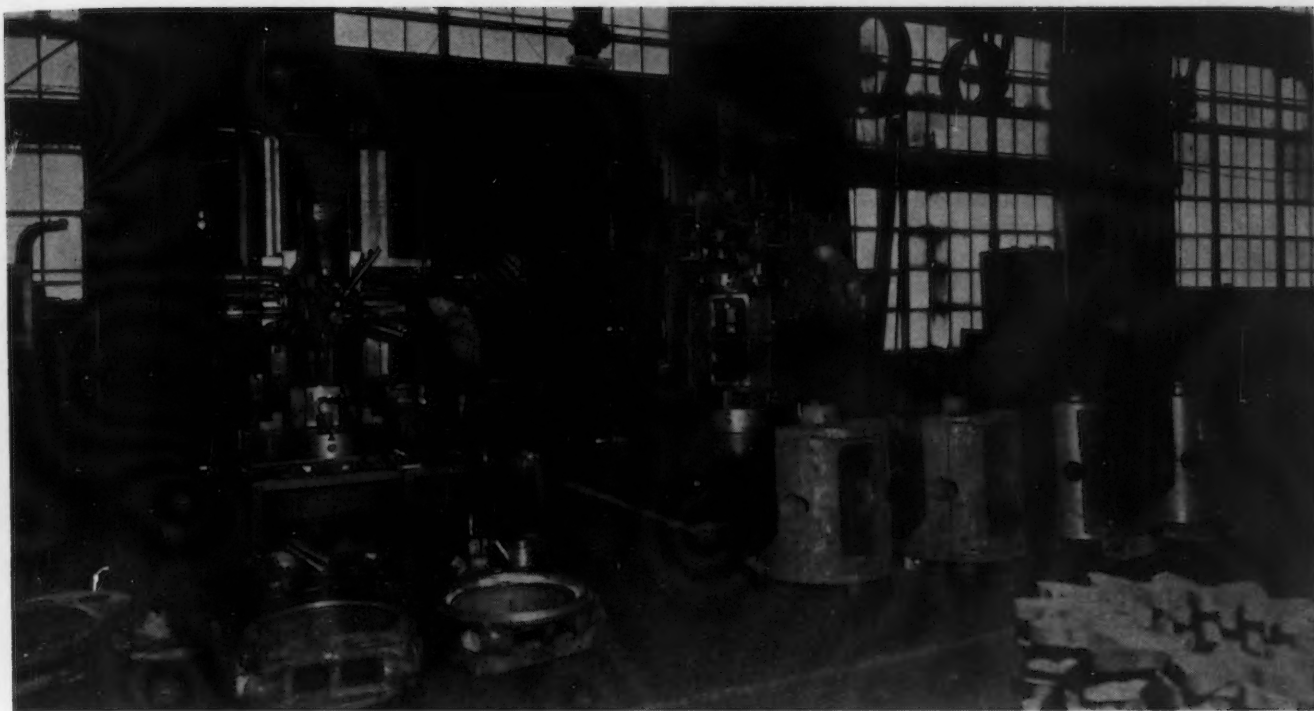
sible. In other words, he became the chief expeditor or project engineer for that particular unit, although each man could draw upon the experiences and ideas of the entire group in deciding on matters of tooling and the like. The arsenal furnished complete drawings and operation sheets, but the latter were used largely as guides or as a point of departure. Obviously, it is always easier to improve upon something already set up than to strike out anew.

For each part, two decisions had to be made as to equipment and tooling: How to do the job on 100 per cent existing equipment, and secondly, how best to do it on either existing equipment or newly purchased machine tools. It will be remembered that one of the company's main objectives was to be the first to deliver an acceptable pilot model. Frequently, when a new machine tool was ordered, it

duplicated many machine tools already in the shop, but it allowed these new machines, which were bought for the account of the Defense Plant Corp., to be assigned to tank work only, whereas many of the older machines still had to do locomotive work on a part-time basis. Such new machines included horizontal boring, drilling and milling machines, big vertical boring mills and vertical turret lathes. In fact the number of boring mills of 84 in. capacity and over, bore a definite relationship to daily output, roughly equal.

Some older machines were adapted for tank work by adding special attachments. A large vertical spindle miller, for example, was converted into a contour miller by the addition of a complicated hydraulic and electric duplicating device which permits the table feed in both directions to be controlled by a template. The follower pin engaging the template through electric devices controls the amount and direction of rotation of hydraulic motors driving the cross and longitudinal feed screws.

Since the job was started on existing equipment, tank work will be found scattered through the various shops of the main plant. Riveting operations are done in the boiler shop, for example, but welding of the tank bogey wheels is done in the tender shop because some of the machinery for forming light plate was already there. Some machinery



OPERATIONS on cupolas and the turret rotors for the 75-mm. gun are carried out on these Bullard vertical turret lathes.

o o o

operations are performed in the cylinder shop and others in the wheel and axle shop, largely because the existing equipment was available there or space could be found for additional purchased equipment. To that extent, "line production" methods, such as were adopted in the completely new Chrysler arsenal, are absent here. As a result, a certain amount of material backtracking is unavoidable, and can be excused on the ground that the company got on with the job in record time and yet was able to meet the obligations of its regular customers who needed motive power to haul the expanded shipping programs in connection with the defense effort.

In the selection of this machinery and the tooling thereof, representatives of machine tool builders and dealer organizations were called in and were very helpful in making recommendations regarding methods and tooling. About 200 new machine tools in all were purchased.

At the main plant, all jig and fixture design came under the direction of a small tools supervisor, who, incidentally, was a member of this tank committee. The program, however, called for more jig and fixture work than is ordinarily encountered in locomotive work, so this department has been greatly expanded into a real tool engineering division. On the other hand, railroad equipment builders as a lot, faced with problems of high

accuracy and low production volume, have had to use considerable ingenuity in evolving low-cost tooling set-ups. The new situation on tanks allowed full play for this type of ingenuity with much greater freedom from the economic side, since the tooling costs could be spread over much greater number of units.

Actually, what happened was that a number of jigs and fixtures were improvised at first in order to "get going," then improved as time went on and particularly as new equipment was delivered, in many cases especially tooled.

It might be presumed that on a fee type of contract, the incentive of maintaining low costs is lost. In fact, ordinarily the incentive is in reverse; the higher cost, the higher the fee. It must be remembered, however, that the company set as one of its own goals the distinction of being the lowest cost contractor of the group. Hence costs were under control from the start. Costs were broken down into straight labor, machine burden rate, supervision, tooling costs and general overhead. Every job had to have a time estimate made since the shop

workers are all paid on a piece rate system. As methods and tooling were improved, there were, of course, revisions made in these time estimates.

As a matter of fact, there has been a constant improvement in both methods and costs since the start. A big factor in this regard has been the experience of the company's Canadian subsidiary which has been producing tanks for the British for a much longer period. Many improvements in methods have been directly transplanted from Canada.

Integrating tank production with locomotive production was another problem that had to be licked. Except for the big castings, parts are sent through the machine shop in lots of 35, which means that for many operations a given machine in the shop is only working part time on tank parts, that is with the exception of the new machines purchased on behalf of the government for this job. This meant that the planning and routing department had to plan machine loadings in combination with locomotive manufacture. This has proved to be one of the difficult jobs, but here again the experience of the Canadian subsidiary has been most helpful. Flow charts, for example, have been devised which show the progress of the work through the shop; the cumulative man-hours expended and whether the part is ahead or behind schedule. This graphical control

system has been transplanted to the American plant.

During the late fall of 1941, steps were taken to produce a portion of M-3-A1 tanks, ultimately the M-4 tanks, with cast steel hulls in place of riveted armor plate construction. At first glance, it would appear that the use of castings would speed up assembly operations. At the locomotive plant, however, this change actually adds an additional operation to the assembly line, that of welding the hull to the sponson plates. All riveted hulls are made in the boiler shop, which is being relieved of that much work as the shift is gradually made to cast

armor steel hulls. As indicated previously, no machining work is done on the big steel castings.

Like every other plant getting into war work, the company was faced with a rapid rise in the number of its employees. In the case of the railroad equipment makers, the problem was accentuated since their activities had shrunk to extremely low levels during the depression years. American Locomotive Co., for example, built only one locomotive in all of 1932. But as the defense program started, locomotive orders began to come through in the biggest volume since 1929. Fortunately, the American

Locomotive Co. had maintained a nucleus organization throughout the lean years, but had to build up largely on the basis of hiring green help, many of them recent high school graduates who had never been inside a shop before. No formal training program was set up. Instead each new man started to work as an observer alongside an experienced hand. The company has been agreeably surprised by the results of this program. Most of these boys appear to have a large amount of mechanical aptitude and have been quick to catch on to the new work.

Nickel Plating Magnesium Alloys

A METHOD for electrodepositing nickel on magnesium alloys is described in a paper presented before the 81st general meeting of the Electrochemical Society at Nashville, Tenn., by W. S. Loose, metallurgist, Dow Chemical Co., Midland, Mich.

The process consists of a series of steps in which the basis metal is first etched slightly in a chromic-nitric-sulphuric acid bath, then treated in a hydrofluoric-nitric acid solution to deposit a fluoride film prior to plating with nickel from a nickel borofluoride bath.

The effect of concentration of the various constituents both in the pretreating and in the plating baths is discussed. Both nickel fluoride and borofluoride plating baths have been studied extensively as to the effect of concentration,

current density, pH and temperature on the type of deposits produced. The deposits obtained on magnesium alloys are soft, adherent and easily buffed to a high luster.

Magnesium alloys, like iron, are anodic to nickel in aqueous solutions and go into solution in preference to the nickel. Unlike iron, however, which has a relatively low contact potential difference with respect to nickel, the potential difference between magnesium and nickel is normally high. Consequently, unless the nickel deposit is non-porous, the electroplated magnesium alloy will not resist corrosion when in contact with water.

In indoor atmospheres, die castings that were plated over two years ago with nickel and chromium have remained in perfect condition

with no signs of corrosion or blistering. These samples, which were on test in the laboratory were not protected against acid and alkali fumes.

Die castings plated with 0.001 in. of nickel will pit after only a few hours in salt spray. Triple plates consisting of nickel, cadmium and nickel deposits on die castings, with a total coating thickness of 0.001 to 0.0015 in., where the cadmium and final nickel deposits have been buffed, have withstood about 20 hr. of exposure to salt spray before pitting began.

At the present stage of development, nickel plated magnesium alloys with a total plate thickness of 0.001 in. may be safely used in atmospheres protected from excessive moisture.

Decarburization Depth in Carbon Tool Steels

DECARBURIZED specimens of 0.78 per cent and 1.20 per cent carbon steel were prepared by Yu V. El'tsin and A. A. Yurgenson, of the *Zavodskaya Laboratoriya*, Russia, by forging and by heating for 2 hr. at 1832 deg. F. in a mixture of 80 per cent hematite and 20 per cent carbon. The mechanism of decarburization in the latter case involves diffusion of carbon to the surface as distinct from diffusion of oxygen in the steel in the case of atmospheric decarburization.

Microscopic determinations of the depth of decarburization on an-

nealed specimens gave consistent results, whereas normalizing of decarburized specimens resulted in a reduction of the decarburized zone as seen under a microscope. Observations indicate that the depth of decarburization is considerably influenced by temperature at which hot working is completed, being greater as the hot working temperature increases.

The possibility of determining the depth of the decarburized zone from the difference in grain size obtained after 2 hr. annealing at 1742 deg F., was examined as an

alternative to the lengthy process of annealing. Because of the oxygen diffusion, decarburized zones developed a finer grain, but where there was carbon diffusion the grain size, compared to the core, was considerably coarser.

Other methods of detecting decarburization depth investigated were based on the differential deposition of copper from various reagents, and differential rates of oxidation, or the formation of temper colors, of the decarburized and undecarburized zones.

"Sewing"

Alclad Aluminum

By WILLIAM E. KLINGEMAN
*Welding Engineer, Federal Machine &
Welder Co., Warren, Ohio*

EXTENSION of the highly efficient, condenser discharge aluminum spot welding technique, with certain additional developments and refinements, to the roller electrode type of welding machine marks the latest advance in the fabrication of aircraft subassembly structures by resistance welding. By the time this article appears in print, the first three condenser discharge roll spot machines to be manufactured will have already been set up in actual operation in two of the larger aircraft factories.

Many months of intensive development work were conducted on the initial laboratory machine prior to the design and construction of these perfected production welding machines. The new records of speed and weld consistency obtained on the new units indicate that advanced manufacturing methods are keeping apace with advanced airplane designs. This new roll spot welding method was developed jointly by the Federal Machine & Welder Co. and the Raytheon Mfg. Co. The complete machine with panel is shown in Fig. 1.

A.C. aluminum seam welders were put into use as early as 1934, but these machines, while proving very useful at the time, could not begin to match present day wartime requirements. However, ever since the condenser discharge spot welders made their appearance in the spring of 1940, aircraft and welding machine manufacturers alike foresaw the possibilities of increas-

... Roll spot welding of alclad sheets by the condenser discharge method will enable the aircraft industry to obtain as many as 300 precision-spaced spots per min.

ing the output of these welders with a roll type machine.

For a standard aluminum spot welder of the condenser discharge type, spot welds in the neighborhood of 40 to 50 spots per min. on a sustained 8-hr. average are generally considered high. On the new roll spot machines, on the other hand, speeds as high as 150 spots per min. can be obtained on 0.040 in. 24-ST alclad sheets where the machines are connected to only one condenser discharge power supply panel. Production can be doubled, or 300 spots per min. obtained, if two condenser panels are utilized and installed in the correct electrical hook-up. During the rolling or spot indexing time and while the previously charged panel is discharging and making one spot, the second bank of condensers is being recharged for the subsequent spot weld.

Probably the special feature contributing the most to the highly successful operation of these machines is the rugged combination motor drive mechanism which permits a wide variation of welding speeds to accommodate a wide variation of stock thicknesses. This feature adds great flexibility to the equipment by being able to apply either a continuous or an intermit-

tent rotating motion in either direction to the driven welding roll. When operated with the rolls rotated continuously, the machine performs similarly to a standard seam welder. When so operated the spot spacing is controlled by means of a special anti-polar electronic timer installed inside the main control cabinet and governed from a convenient location on the machine.

When operated with the rolls rotated intermittently, the rolls themselves are always at rest during the discharge of the welding current. A predetermined cooling and forging time interval is thus provided so that each weld nugget can solidify before the rolls index to the next weld location. Each welding impulse or current discharge is in synchronization with the intermittent rest period. The application of the forging pressure also will only be actuated at the correct interval. This change from continuous to intermittent rotation of the rolls is readily accomplished by means of a simple gear change accessible on the outside of the gear unit, Fig. 2.

The complete roll drive mechanism is of precision construction and operates through a constant

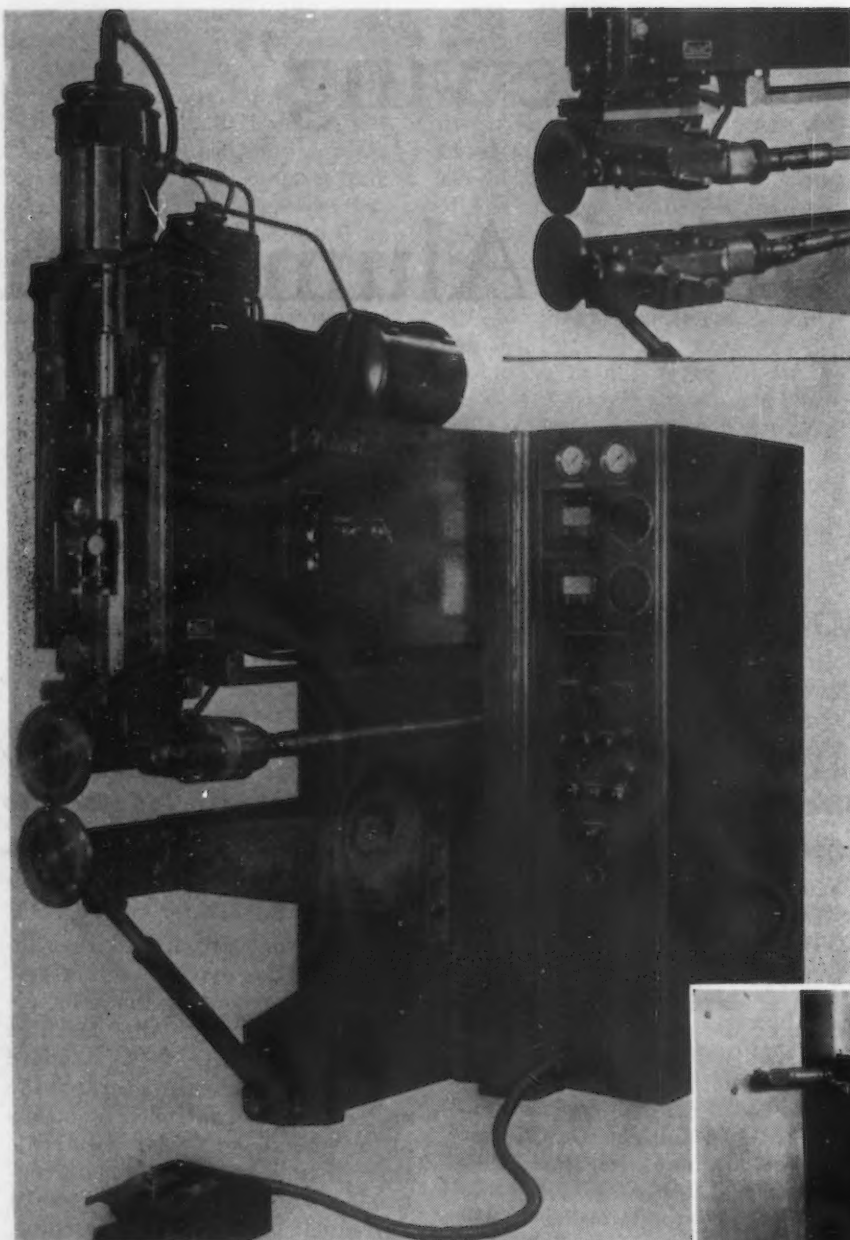
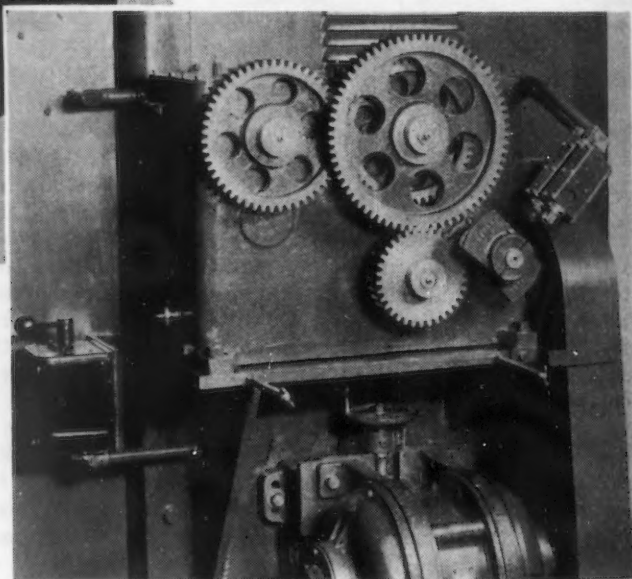


FIG. 1—The condenser discharge principle has been applied to a continuous or intermittent spot welder for fabricating aircraft subassemblies. The first Federal Uni-Pulse machines have just been put into operation. Inset shows alternate design in which both the upper and lower rolls are power driven.

AT RIGHT

FIG. 2—Change gear arrangement for converting from continuous to intermittent operation of the welder rolls.



mesh principle employing a Geneva wheel and special positive locking device. A two-speed motor is utilized, along with a Reeves infinitely adjustable pulley unit for supplying an adequate flexible control of the linear speed of the welding rolls.

The increase in speed over spot welding is contributed mainly by the following reasons:

- (1) There needs to be no vertical lowering and retracting time interval for the upper electrode between successive welds as the two roll electrodes are in continuous contact with the work until its removal.
- (2) Down time, ordinarily required for tip dressing and replacement of fixed electrodes on spot weld-

ers, is almost entirely eliminated on roll welding equipment since the electrode rolls may be dressed while in rotation, without making it necessary to lose valuable productive welding time. The roll electrodes are water cooled internally for this application and, due to the large circumferential welding surface, welding heat is readily carried away from the localized contact surface of the weld. Then as the electrodes index for the subsequent welds, a new or clean contact surface appears on both the upper and lower roll electrodes, aiding in obtaining weld consistency.

- (3) For the welding of over-lapped sheets and other large straight line welding jobs, roll welding greatly speeds the work handling or spot-pitch time. This method of welding literally sews the al-clad aluminum sheets together by means of a row of spot welds, automatically spaced and perfectly made. Scientific stress analyses have indicated that this ultra-fast joining process is superior to riveted structures in many instances.

Another distinct advantage of roll welding is the condition of the

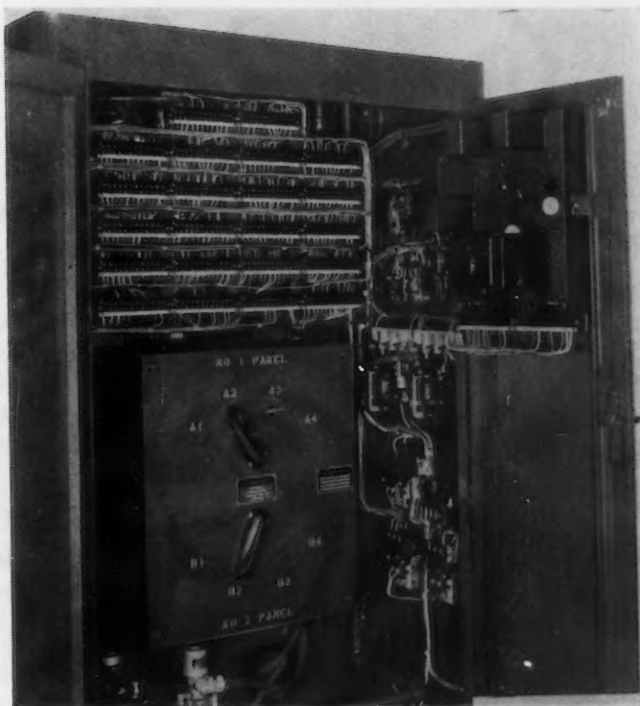
finished product. Although this does not involve welding speed, it is of the utmost importance. The rolling electrodes, because they contact the work at all times, apply a constant rolling action upon the work between each successive weld, partly eliminating the separation of the two or more thicknesses of stock.

Space permits covering of only the highlights of the many proven and tested features of the Uni-Pulse condenser discharge aluminum spot welders which have also been applied to the new roll welding application. By far the most important aiding factor is the Federal patented rubber head design for assuring uniform dynamic response of the movable upper electrode member in coordination with the deformation of the weld region. Due to the rapid heating and cooling of the aluminum during the welding current impulse, this low-inertia, frictionless head greatly reduces any tendency towards internal cracks and voids in the weld nugget. Secondly, the main slide operates in precision ground slide ways through the use of anti-friction rollers mounted on the slide itself. Other contributing factors are: Provision of forging pressure facilities during the welding cycle; long retracting stroke of the upper electrode wheel for ease of work insertion, and fully electronic control of discharge current, along with the electrostatic storage of weld energy.

Unique electronic means of stabilizing the magnetizing conditions of the high voltage welding transformer core iron also has been applied on these new machines, thus eliminating one of the difficulties encountered on the first condenser spot welders.

Fig. 3 shows the interior of the machine control panel mounted on

FIG. 3—Interior of the control panel for the condenser discharge type roll welder. All operating and indicating instruments are placed on the front of the panel. Shown here are the terminal connecting blocks, sequence control panel, water solenoid valves and interlocking relays.



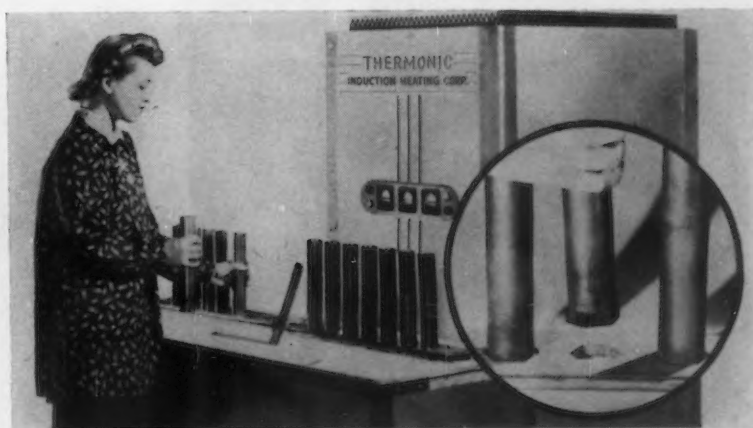
the right hand side of the main frame. All adjusting, operating, and indicating instruments necessary for the operation of this welder are placed on the front face of this panel within easy reach and sight of the operator. Fig. 3 also shows terminal connecting blocks, sequence control panel, water solenoid valves, and interlocking relays.

A rotary cleaning device is available on these machines for effectively and rapidly cleaning the welding surfaces of the circular electrodes. A scraper attachment may also be mounted near the upper and lower welding heads to occasionally

trim the electrode surfaces to the proper contour.

One can speculate to what magnitude ROLL SPOT aluminum welding may rise in the near future and the high position it may attain in the aircraft field. Today, with mass production scheduled far in advance, the aircraft manufacturer may justify a larger initial expenditure for high production machines. Continually, the aircraft designer is extending resistance welding to additional sections of the plane, previously of riveted or some other low production construction.

■ ■ ■
IN the set-up pictured, bases are brazed to tubular sections by induction heating, seven at a time, using a silver brazing alloy which penetrates instantly through the joint. Thermonic induction heating is applied instantly by push button control and 10,000 units can be processed a day on a continual production basis. The temperature rise is confined to the brazed area, with no annealing beyond. The strength of the braze is as high or higher than the solid parts. As this joint is free from internal oxidation, the need for subsequent cleaning is greatly reduced. Another important feature is the cost, which is estimated at 0.1c. per braze, based upon a power rate of 2c. per kw-hr.
 ■ ■ ■



Micro and Macro

CONSIDERING the growing importance of gray cast irons as an engineering material, relatively little attention has been given to studies on the macro and micro characteristics of gray iron and their effects on the physical properties of the castings. This has been partly due to difficulties arising in the development of a preparation technique adequate for revealing the true unetched and etched structures and in reproducing these structures for illustrative purposes.

It is the purpose of this article to outline and demonstrate the effectiveness of a simple grinding and polishing technique, developed to obtain the true micro and macro

By **CHARLES R. AUSTIN**
Professor of Metallurgy, Pennsylvania State College,

and

M. M. LIPNICK
Meehanite Metal Corp., Pittsburgh

o o o

structural characteristics of gray irons in both the unetched and etched condition, and to indicate how the observed structures can be recorded for illustrative purposes. The report also presents a preliminary study on the correlation of casting conditions with the tensile properties of "A" Meehanite metal, and indicates an association of cer-

tain rather clearly defined macro-structural appearances of the cast bars with specific tensile properties.

The sample, cut to convenient size, is ground to a flat surface on a wheel, then ground successively through a series of emery papers: 1G, 1, 0, 00, and then on a 000 paper which has previously been rubbed with cotton to remove any loose grit. Alcohol may be used to moisten this 000 paper, prior to rubbing with cotton, but in either case a dry paper is used for the final grinding operation. At this stage, the scratches on the specimen should be very fine and uniform, as illustrated in Fig. 1, at 200 diameters. The graphite flakes are actually covered with a film of

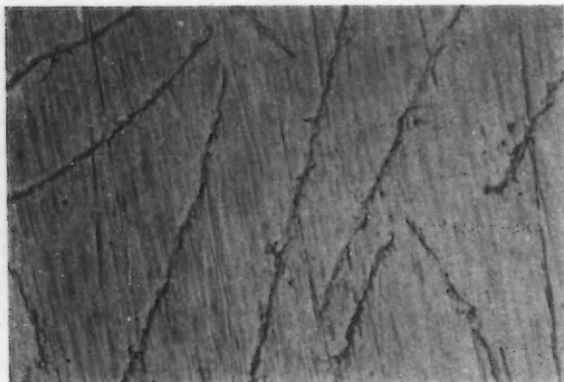


FIG. 1—Gray iron, polished through No. 000 paper and, magnified 200 times.



FIG. 2—The same area as shown in Fig. 1 is illustrated here after final polishing, enlarged 200 diameters.



FIG. 3—The same area as shown in Figs. 1 and 2, etched in 4 per cent picrol, enlarged 200 diameters.

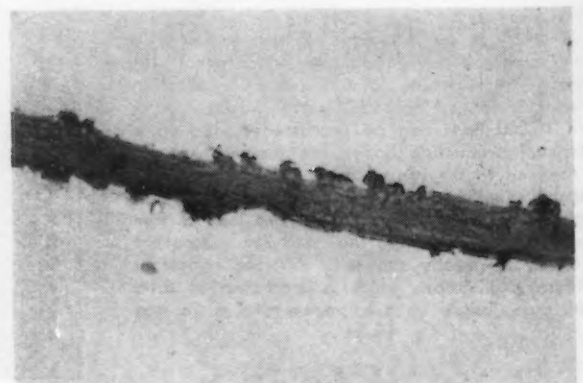


FIG. 4—Graphite flake, unetched, and enlarged 1000 diameters.

Microstructures

—of Gray Iron and Meehanite

flowed metal which helps to prevent them from being torn out during subsequent polishing procedures.

The actual polish is obtained in several operations using a "selvyt" cloth, impregnated with magnesium oxide or "shamva" paste. To prepare the cloth for polishing, it is placed on the wheel and saturated with water, after which dry "shamva" powder is rubbed into the cloth until a pasty condition is obtained. No further addition of water or powder is necessary or desirable for completely polishing the sample. The paste accumulating on the edges of the sample, however, should be returned to the wheel. During the polishing operation the specimen should be rotated in a direction opposite to the travel of the wheel.

After final grinding with the No. 000 paper, the specimen is polished on the prepared "selvyt" for a period of $\frac{1}{2}$ to 1 min. with moderate pressure. It is then washed thoroughly, dried with alcohol, and lightly etched by a simple dip in a solution of 4 per cent nitric acid in alcohol. The specimen is washed, dried, and repolished for about 30 sec., to remove the light etch. This light etch and polish procedure is repeated from three to five times in order to obtain a scratch-free un-

... Grinding, polishing and etching procedures, as well as new photographing technique for gray iron and Meehanite, are described herein.

etched surface as illustrated in Fig. 2, which shows typical graphite flake distribution in an ordinary gray iron. The complete retention of these graphite flakes is readily noted, and the satisfactory nature of the polish as well as the sharp delineation between graphite and matrix is perhaps more clearly revealed in Fig. 4 at 1000 diameters magnification.

An etched section of the area shown in Figs. 1, 2 and 3 was obtained by use of the conventional picrol solution. This reagent permits better control of depth and uniformity of etch than the 4 per cent nitro solution. This rapid polishing and etching procedure has been utilized in this study on the

nature of the graphite flakes observed in ordinary gray irons.

Graphite Flakes

When a graphite flake is observed under the microscope, it is light dove gray in color. However, it has usually been found difficult to transfer this tone quality to the photographic plate and print, and it has become customary to note the presence of black graphite flakes in an unetched white matrix or in an etched background of pearlite. Perfect reproduction might be approximated if color photography is used instead of panchromatic type plates, where tone quality alone must serve to give definition.

Various types of wratten filters



FIG. 5—Shown here are details of graphite flakes, reproduction of which is dependent upon the use of anti-halation panchromatic plates, at 100 diameters.

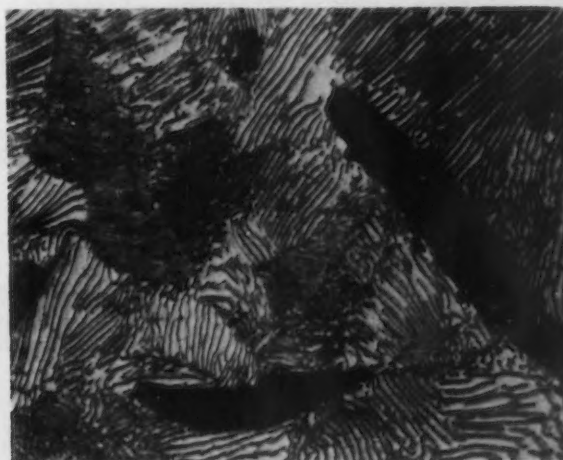


FIG. 6—The etched structure of Meehanite Type GC, obtained after developing in D76C solution, at 1000 magnifications.



FIG. 7—This is the same area as shown in Fig. 6, using D19 for plate development at the same magnification.



FIG. 9—This is the same area as shown in Fig. 8, using D19 for plate development, 600 diameters.

were used to try to improve the detail and tone quality in the reproduced structure of gray irons. Although the visual appearance of the structure could be slightly improved with certain of these filters, this improvement did not show in the photomicrographs taken. Accordingly, the usual yellow-green filter was used throughout in the preparation of illustrations for this paper.

Further studies with respect to photographic plates, developing solutions, and suitable grade printing papers demonstrated that it was practicable to establish conditions which permitted reproduction of structures essentially similar in appearance to those viewed under the microscope.

Consider first the appearance of an unetched microsection at 100 diameters. This magnification is widely used to indicate the size and distribution of the graphite flake, and the photomicrograph invariably consists of black stringers in a white, unetched matrix. All true quality is lost on the photographic plate. By use of a backed plate, however, in which halation is largely eliminated, the actual visual appearance of the properly polished specimen can be transferred to the negative. By use of a suitable paper these qualities can also be transferred to the photographic print. Fig. 5 demonstrates this feature rather clearly and it should be evident that the details observed in the graphite flakes are not dependent on under-exposure or under-development of the print. For this record the plate was developed in D76C Eastman Kodak solution and printed on a No. 4 AZO glossy paper. It may be noted that the matrix or background of the structure is gray rather than white, but it is suggested that this feature in no way detracts from the instructive usefulness of the illustration.

In reproducing etched structures of Meehanite and gray irons at higher magnifications, it is a simple matter to demonstrate the importance of plate developing solution. Figs. 6 and 7 were taken from identical areas of an etched structure at 1000 magnifications using anti-halation Wratten M plates. The former was developed in D76C solution and the latter in solution D19. It must be assumed that optimum printing conditions were employed in each case. In Fig. 6 may be noted the clear details of both the pearlitic structure and the graphite flakes. A similar contrast may be drawn between Figs. 8 and 9 at 600 diameters.

These photomicrographs illustrate the same general features but emphasize more clearly the definition and detail of all constituents, obtained by using D76C solution. The tone quality of both the graphite flakes and the non-metallic inclusions is well brought out along with the details in the pearlite and the scattered free cementite. Fig. 9 is typical of many photographic reproductions of etched gray irons which are familiar, but Fig. 8 presents a much better reproduction of the iron as observed under the microscope. The appearance of the non-metallics in Fig. 8 as contrasted with those in Fig. 9 can also be noted.

The response of this technique to photographic efforts to reproduce micrographs which permit study of the nature of the graphite flake concomitantly with all other structural details is discussed more fully in the next section of the article.

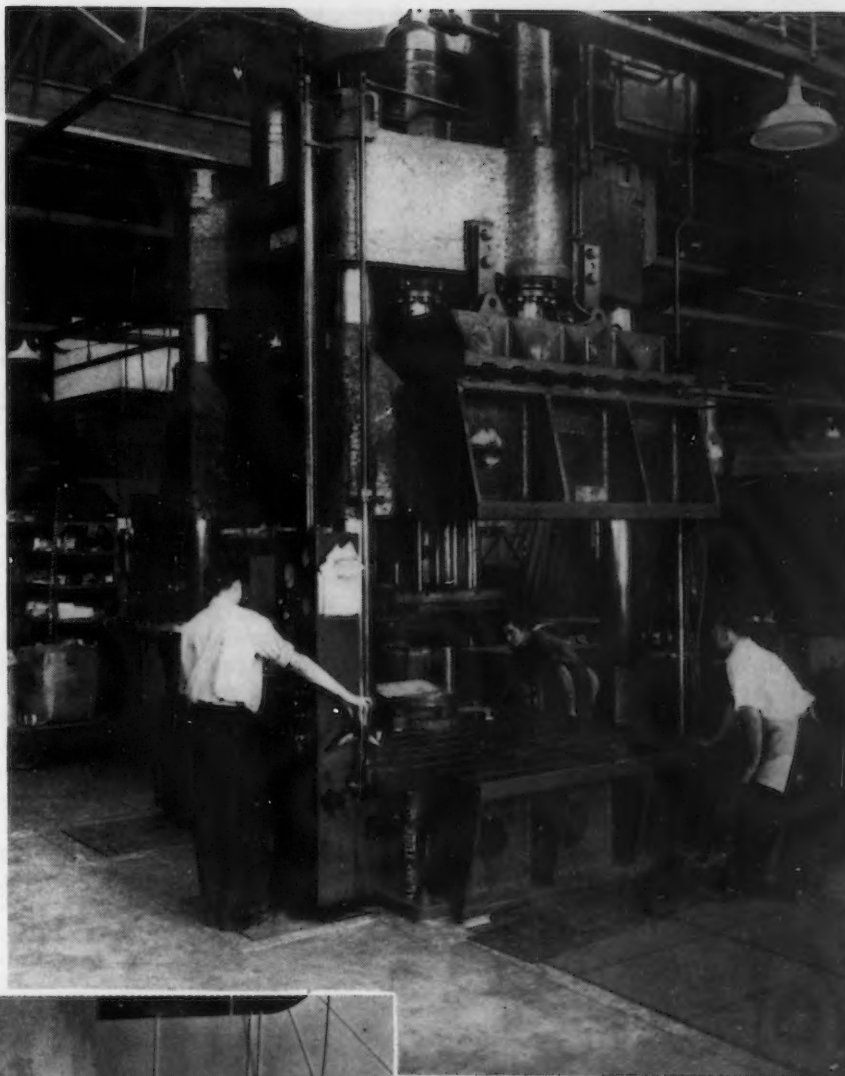
Ed. Note:—Next week the author concludes with data on the use of this technique to study structural details.



FIG. 8—The etched structure of a high carbon iron brake drum after developing the plate in D76C solution. 600 diameters.

Lockheed Speeds Press Work

SPEEDING production of warplanes at the Lockheed Aircraft Corp. factory in Burbank, Cal., is a battery of new double and triple acting hydro-presses using hard dies of alloy cast iron and conventional drawing rings. This equipment is replacing drop hammer work to a considerable degree. Such presses as the 800-ton double acting press illustrated make perfect parts with deep draws that require a minimum of re-work or trimming. In many instances the value of the new presses is enhanced by the fact that they permit forming of dural sheets that have been heat treated beforehand. In the press shown, pressure is applied to the hold-down ring through pins extending through the main forming platen to a clamping platen above it. The single acting clamping rams have a capacity of 300 tons, and the main forming ram, 500 tons. In addition there are double acting pull-backrams of 60-ton capacity and a hydraulic die cushion of 120-ton capacity is provided in the bed. Maximum operating pressure in the hydraulic system is 2700 lb. per sq. in.



LEFT

MERRY-GO-ROUND on the production line at Lockheed is this 250-ton single action hydraulic press with a rotary table that can handle more than 20,000 parts in eight hours with only a handful of men. After each "feeder" has placed one or more blanks on the die as it wheels past him, the rotary table is indexed to bring the die stations successively under the rubber pad on the moving platen. Up until recently, all forming and blanking by the rubber pad process was done on two huge presses of 2500 and 4500-ton capacity, requiring some 20 men to handle about 12,000 parts in eight hours. The machine shown costs about one-third that of the bigger press and turns out nearly twice as much work with less than half the manpower. This effects great savings in time and expense in the fabrication of dural parts for the Lockheed "Lightning" P-38 pursuit ships and Hudson bombers.

Novel Cold Reducing Mill

A NEW procedure for the cold reduction of strip metal, involving the use of both rolling and drawing actions, has been designed and developed by Simons Laboratories, Inc., New York, and recently placed into experimental operation at the Scovill Mfg. Co., Waterbury, Conn. The rolling and drawing action on the metal being reduced is applied by a pair of small diameter work rolls that have a reciprocating motion in opposite directions to each other and transversely to the direction of the movement of the strip. While the rolls are being simultaneously rotated by pressure from the back-up rolls, the strip is pulled or drawn between the work rolls at a speed greater than the surface speed of the rotating rolls.

The Simons mill at the Scovill plant illustrated in Fig. 1, is a 12-in. four-high mill. The tool steel operating rolls are 1½ in. in diameter, and the cast iron back-up rolls are 8 in. in diameter. All rolls are

... An interesting method of cold reducing strip metal, involving the use of both a rolling and drawing action. The 1½-in. work-rolls rotate conventionally, and at the same time reciprocate in opposite directions, transverse to the direction of the strip movement.

• • •

By W. A. PHAIR

Associate Editor, *The Iron Age*

• • •

15½ in. long. The mill proper is connected through a gear box to a 35-hp. motor that both imparts the rotating and reciprocating motion to the rolls. The power is applied to the back-up rolls, which are directly rotated, and which in turn rotate the operating rolls by frictional contact.

Each back-up roll is carried in a stationary, longitudinal bearing, and the operating rolls are supported by the back-up rolls and by independent stationary, longitudi-

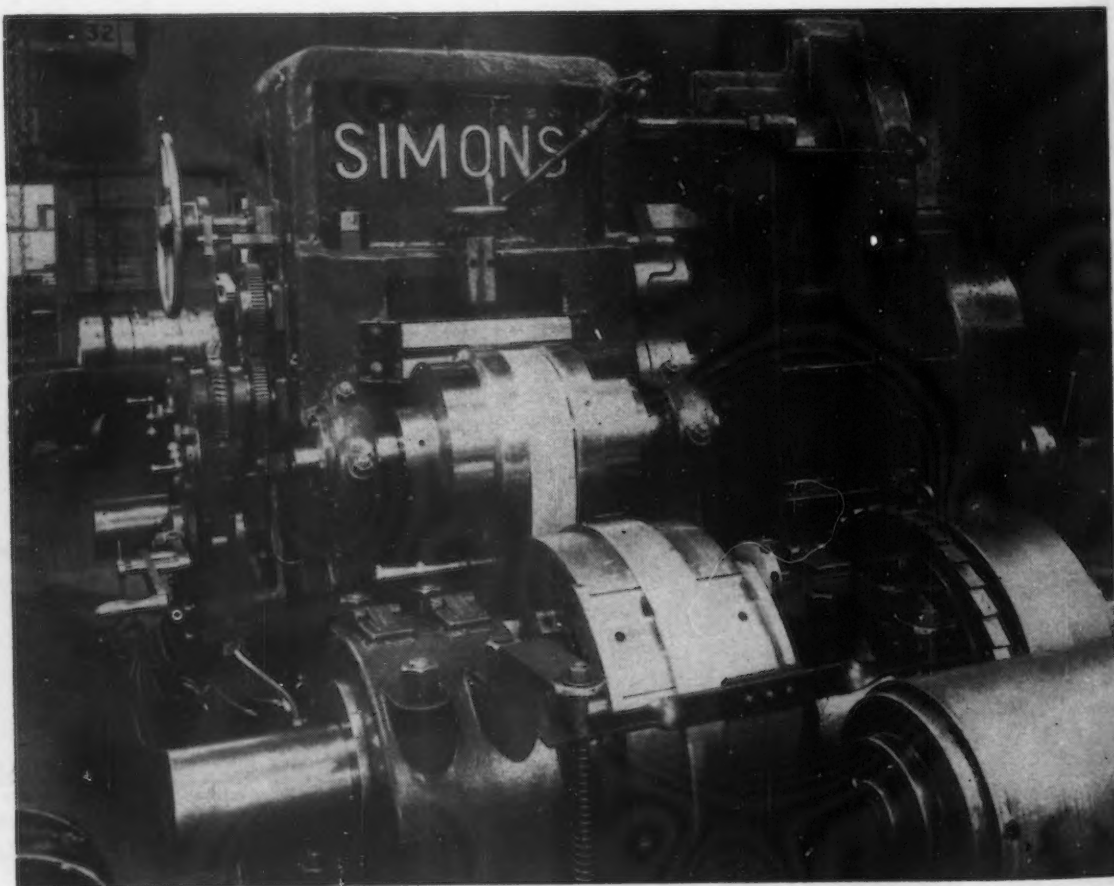
nal bearings. Within these bearings, each back-up roll and its work-roll reciprocate in opposite directions at equal speeds in unison as a unit. The reciprocating movement covers a distance of 3 in. The action of these rolls is shown in Fig. 2.

The strip is pulled through between operating rolls by a winding drum operated through a reduction gear by a 175 hp. motor, shown in Fig. 3. The speed of the outgoing reduced strip, between

• • •

FIG. 1 — The winding drum shown here draws the strip through the rolls, at a rate faster than the surface speed of the work rolls. The work rolls also compress the strip by transversely being pulled across the metal.

• • •



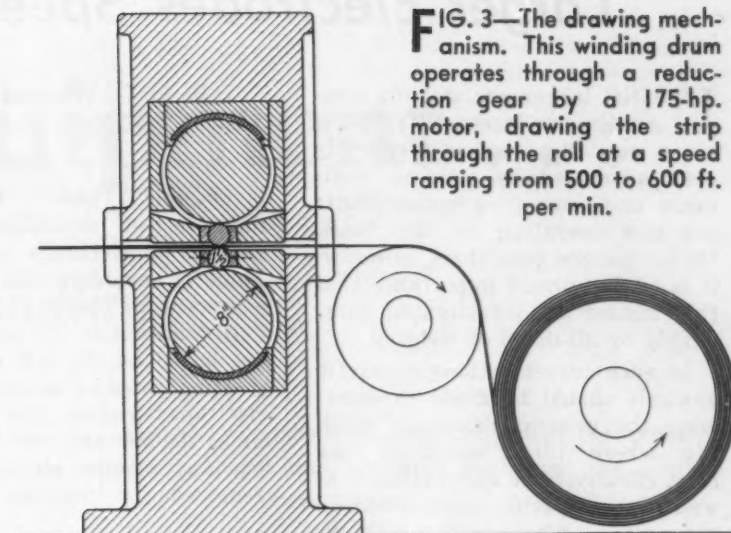
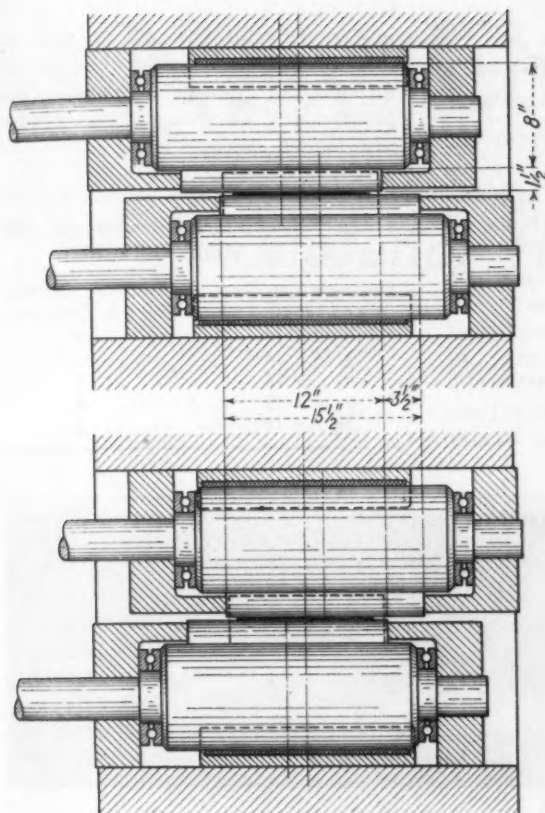


FIG. 3—The drawing mechanism. This winding drum operates through a reduction gear by a 175-hp. motor, drawing the strip through the roll at a speed ranging from 500 to 600 ft. per min.

FIG. 2—This sketch shows the reciprocating action of the rolls, and the comparative sizes of the back-up and work rolls.

500 and 600 ft. per min., is greater than the surface speed of the work rolls, thus imparting the drawing action on the strip as it emerges from the rolls.

While a 5-in. demonstrating mill constructed by Simons had a conventional screw-down, no screw-down is used in the Scovill mill. The distance between the back-up rolls remains constant, and the variation in thickness of the reduced strip is accomplished by a horizontal movement of the operating rolls with reference to the back-up rolls. However, the mill can be constructed either with or without the conventional screw-down, as desired.

As pointed out, the main difference between the Simons mill and conventional rolling mills is that this new mill draws the strip as well as rolls it between the operating rolls. In conventional mills, the strip speed is substantially equal to the surface speed of the operating rolls, while in the Simons mill the strip is pulled at a speed greater than the surface speed of the operating rolls.

In conventional cold rolling, the rolls bite or grip the strip to compress it and push it forward. Even in mills that are operated with

idle rolls rotated by the pull of the strip, there must be a bite or grip so that the strip will rotate the rolls. In the Simons mill the strip must slip between the rolls and the large bite found in other cold rolling mills must be avoided. In rolling strip, the surfaces of the rolls in standard mills present a small angle to the incoming strip and a comparatively long portion of the strip must be in contact with the rolls. Rolls in the Simons mill present a large angle to incoming strip and a small portion of the strip is in contact with the roll so that a strong grip will be avoided and the strip can be drawn freely between the rolls.

It has been learned in wire drawing that the quality of the finished wire depends to a great extent upon the entrance angle of the die. If the entrance angle is small, the wire becomes much harder than if a large entrance angle is used. The same is true of strip. By using small, 1½-in. diameter work-rolls, a larger entrance angle is presented to the incoming strip, and the strip does not harden as much as it would if rolled with the customary large diameter rolls. It is therefore possible, on the Simons mill, to make

a large reduction in each pass and a very large total reduction in the thickness of the strip without intermediate annealing.

In the Simons mill the strip is drawn, reducing it in thickness and also slightly in width. The edges remain of the same thickness as the rest of the strip and do not become rough and jagged. Also, in this mill, the rolls are supported by longitudinal friction bearings, and therefore do not have a bending tendency and do not cause the strip to crown. If the hot rolled strip fed into the Simons mill has a large crown, the crown will be removed to a greater extent than in a conventional cold rolling mill.

The sliding, reciprocating motion of the rolls within their respective longitudinal friction bearings is necessary to reduce the frictional surface resistance. Without this sliding motion, the rolls would become jammed in their bearings and would not rotate. This sliding motion, likewise, reduces the frictional surface resistance between the rolls and the strip, thereby facilitating the drawing of the strip between the rolls. As a result of this method of drawing strip between sliding reciprocating rolls, a highly polished surface is imparted to the metal.

The transverse sliding motion of the operating rolls across the face of the strip also tends to polish the surface of the rolls themselves, greatly reducing their tendency to develop tracks or grooves.

Larger Electrodes Speed Up Arc Welding

USING larger arc welding electrodes for increased speed is not a new idea; it has frequently been advocated by welding engineers and some progressive plants are now operating on this basis. Under today's conditions, however, it is of the utmost importance that this matter be investigated thoroughly by all users of welding.

In such investigations a careful analysis should be made to determine the general classes of welding where this "speed-up" can most effectively be accomplished, as well as the specific applications in these classes where work conditions permit larger electrodes to be used. The following considerations will serve as a guide in changing from smaller to larger electrodes.

A 3/16-in. diameter electrode is the largest size with which it is practical to weld in the vertical and overhead positions. Larger electrodes require amperages which produce too much heat for proper control of metal in vertical and overhead welds; as a result spatter loss is excessive, and poor welding results.

An increase from 5/32 to 3/16-in. diameter electrode is not recommended for vertical fillet welds until the size of the fillet reaches 5/16 in. or greater. A 5/32-in. electrode is preferred for making 1/4 in. and smaller fillet welds in the vertical position. A 3/16-in. electrode applied to these smaller size fillet welds results in surplus weld metal being deposited in the form of a convex bulge on the fillet which would not contribute to strength and would waste scarce electrode material.

Many applications are such that the work either is or can be successfully positioned for flat welding. In this, as in the vertical and overhead positions, plate thickness will affect the maximum size electrodes that can be regarded as practical to use. Generally speaking, electrode diameters up to the plate thickness can be used. This is affected, however, by other conditions, such as fit-up, type of joints, etc. Electrodes are available in sizes up to 3/8 in. diameter. Larger sizes have not been proven to be practical to date.

In those cases where work conditions permit a change to larger electrodes a considerable speed-up

By H. O. Westendarp, Jr.
Welding Engineer, General Electric Co.

is possible. Table I indicates the increase in deposition rate in pounds of electrode per hr., and Table II considers this increase on a percentage basis.

In addition to the savings which are based on the difference in deposition rates of electrodes, larger electrodes reduce the number of times the operator has to stop welding and change electrodes. Time required for cleaning the crater

and restriking the arc is also reduced. The number of changes required per pound of metal deposited for various size electrodes are shown below.

Table III—Electrode Changes Per Lb. of Metal Deposited

Electrode Size, Diam. and Length, In.	Electrode Changes Per Lb. Deposited
5/32 x 14	18
3/16 x 14	13
1/4 x 18	5
5/16 x 18	3
3/8 x 18	2



EACH of these welds required one minute to make. That at the top is a 1/4-in. fillet which is 5.75 in. long. It was made with a 3/16-in. electrode. Using a 1/4-in. electrode and producing the same size fillet, the lower weld attained a length of 10 in. in the one minute period.



Table I—Typical Deposition Rate, Lb. Per Hr.—100 Per Cent Arc Time

Electrode Diameter, In.	Flat*	Horizontal*	Vertical*	Type of Electrode
5/32	2.9	2.7	2.4	All-position d.c. Reverse
3/16	4.5	4.0	3.2	All-position d.c. Polarity
1/4	8.0	6.0	—	Flat a.c. or d.c. Straight
5/16	11.5	—	—	Flat a.c. or d.c. Polarity
3/8	13.5	—	—	Flat a.c. or d.c.

* Current at proper value in all cases.

Table II—Increase in Deposition Rate Obtained with Larger Electrodes

Position of Welding	Change in Electrode Size, In.	Increase in Deposition Rate Per Cent
Vertical and Overhead	5/32 to 3/16	33
Horizontal	3/16 to 1/4	50
Flat	3/16 to 1/4	77
Flat	1/4 to 5/16	43
Flat	5/16 to 3/8*	18

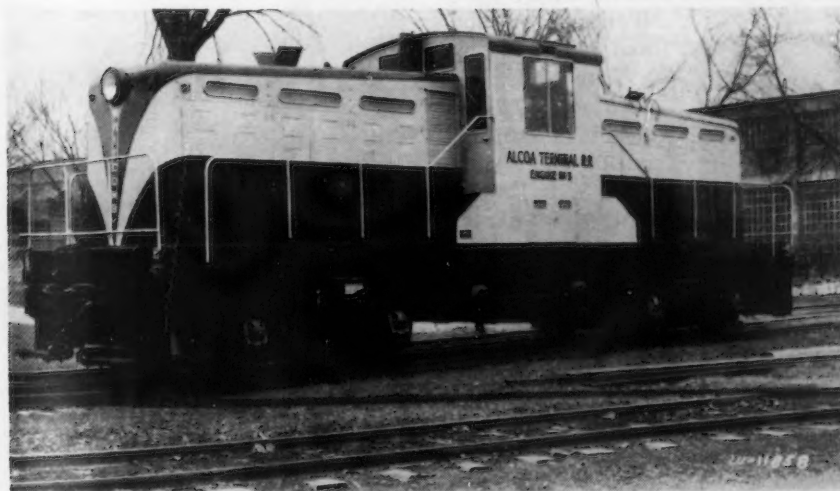
* Experience indicates that magnetic arc blow increases with the size of electrode and welding current. Therefore the 3/8-in. diameter electrode is generally recommended for operation with alternating current only.

New Equipment...

Material Handling

Some of the more recent developments in conveying equipment, cranes, electric trucks, skid platforms, hoists and accessory equipment are outlined on these pages.

THE *Whitcomb Locomotive Co.*, Rochelle, Ill., has added a new diesel-electric to their line of internal combustion locomotives. An 80-ton unit powered by two Buda 325-hp. supercharged diesel engines, it operates at speeds up to 40 miles per hr. Normal tractive effort is 40,000 lb. at 25 per cent adhesion; by using sand this figure can be increased to 53,300 lb. A unique feature is the arrangement of the power plant assemblies which places the radiators at the cab end to increase accessibility of the generators for inspection. The complete sub-base assembly can be removed through a hatch in the hood. Adjustable shutters on each side of the hood are designed to maintain even water temperature in both engines. The trucks are of the built-up type, each carrying two traction motors.



65-ton Diesel Electric
THE outstanding feature of the 65-ton diesel electric switcher built by the *Atlas Car & Mfg. Co.*, Cleveland, is said to be the construction of the drives which give it a starting tractive force of 39,000 lb., a continuous tractive effort of 14,900 lb., and a maximum road speed of 30 miles an hr. Drives are of the double reduction spur gear type, totally enclosed and arranged so that the motors are mounted as integral parts of the drives. Underframe is fabricated



by combination riveting and welding methods, using rolled steel sections and plates.

Electric Tractor

REDESIGN of the "Tug" electric tractor built by *Mercury Mfg. Co.*, 4144 South Halsted Street, Chicago, has resulted in a lowering of the seat and controls. The tractor, which is intended for operation in



NEW EQUIPMENT

tunnels or where low overhead obstructions occur, has also been fitted with a protective steel canopy over the operator's seat.

Hydraulic Lift Truck

AN improved model lift truck, a product of the *Crescent Truck Co.*, Lebanon, Pa., will handle 7-in. hand truck skids weighing up to 2500 lb. A truck of this type will,



it is said, replace three to five hand trucks at an operating cost of one-third the daily wage of a laborer. The operator raises the platform by running under a skid and pumping it up with a foot pedal. Lowering is hydraulically controlled by a lever on the dash.

Fork Trucks

SIX models of fork type trucks in capacities of 1000, 1500 and 2000 lb., with finger lifting heights of 60 to 108 in., are included in the new line of the *Clark Tractor Division of Clark Equipment Co.*, Battle Creek, Mich. Continuous operation is said to be possible because they are powered by four-cylinder gasoline engines. They have front wheel drive, rear wheel steering and hydraulic lift and tilt. Speeds are one to seven miles an hour.



Utility Truck

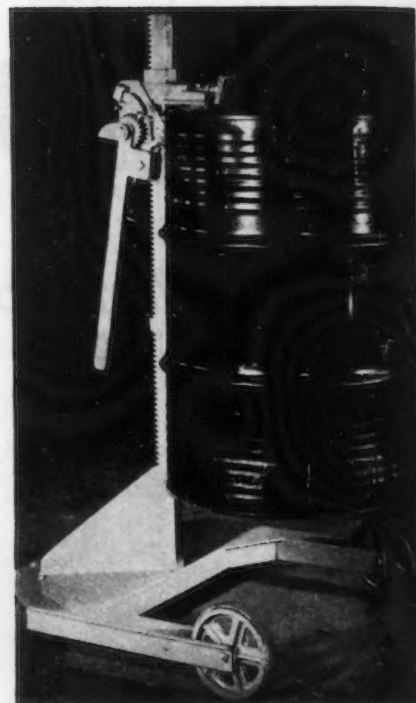
BUILT to serve as a repair truck, this novel unit can also be used as a portable work table or parts truck. It is built of steel, with a 1¾-in. maple planked top, by the *Service Caster & Truck Co.*, Albion, Mich. One side of the unit contains 12 drawers and two compartments, and a panel pulls out and down over the drawers as a protection against theft. The other side has a single



large compartment divided by a shelf and enclosed by sliding doors. Swivel casters have lock and brake.

Half-Ton Shop Truck

THE BUDA CO., Harvey, Ill., has developed a half-ton industrial truck known as the Chore Boy. Weighing 800 lb., and powered by a four cycle, air cooled, 7.7-hp. gasoline engine, it is said to average 35 to 38 miles per gal. of gasoline. Loading capacity is 1000 lb., and loading space is 12.8 sq. ft. With a width of 37 in. and a three wheel construction it can be turned in a radius of 7 ft. 3 in.



Barrel Carrier

ERNST MAGIC CARRIER SALES CO., 1456 Jefferson Avenue, Buffalo, is building a barrel carrying unit that is said to eliminate accidents common in handling loaded drums. Operation of a handle using the rack and pinion principle lifts 55 gal. drums a distance of 14 in. so they can be placed on skids, scales or platforms.

Shell Handling Truck

FOR moving large shells and similar cylindrical products the *Lewis-Shepard Sales Corp.*, 245



NEW EQUIPMENT

Walnut Street, Watertown, Mass., has developed a new two-wheeled truck. Ball and roller bearings and rubber tired wheels, together with a design which pivots the load about a point near its center of gravity are said to permit easy handling of loads up to 1½ tons. A hydraulic check cushions movement of the load on release.

Industrial Truck Tire

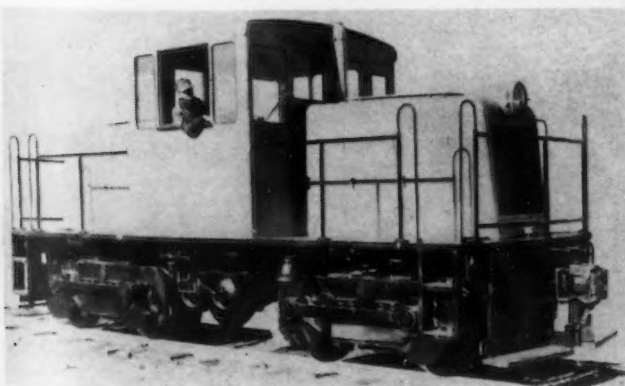
CALLED the world's largest industrial truck tire, this 206-lb. doughnut of steel and rubber is



used on trucks handling strip steel. A product of the B. F. Goodrich Co., Akron, it is made of solid rubber with a grooved tread construction and has an overall diameter of 22 in. and a width of 16 in.

45-ton Switcher

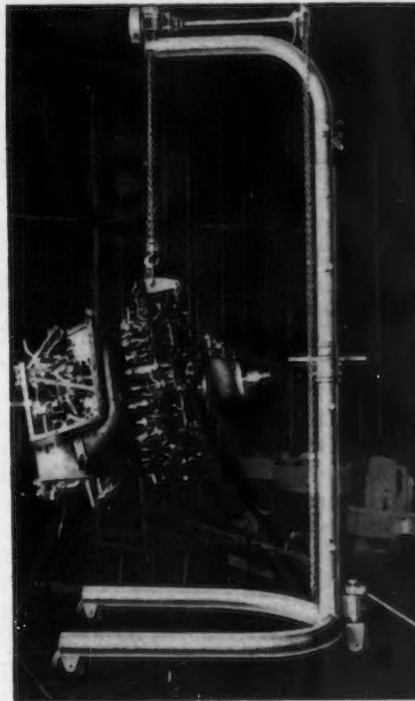
SIMPLIFIED construction and easier handling and maintenance are among the improvements said to be incorporated in the new 45-ton industrial diesel-electric locomotive built by General



Electric Co. The controls at the operating station have been rearranged to make them more convenient for the engineer, particularly when he is leaning out of the cab while operating the throttle and brake valve. The instrument panel has also been rearranged, and air and fuel capacities increased. Cab windows have been redesigned and a hydraulic throttle substituted for the mechanical type formerly employed.

Portable Hoist

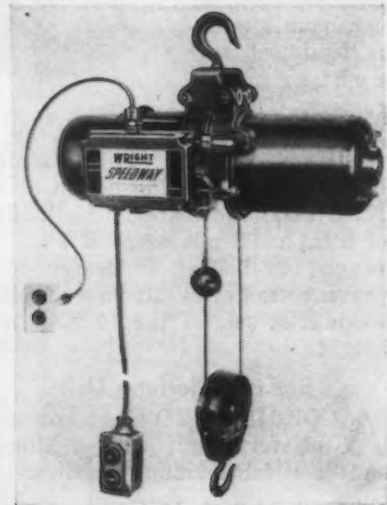
A PORTABLE hoist of simplified design is announced by the Aviation Department, Whiting Corp., Harvey, Ill. Though origi-



nally designed for the aircraft industry the new hoist is also in use in general manufacturing operations. A chain hoist raises and lowers the work or supports it at any desired height and an extension keeps the hand chain safely away from the load. A brake locks the hoist in position. It is available in one or two ton models.

Half-Ton Electric Hoist

SPEEDWAY is the name of a wire rope electric hoist recently added to their line by Wright Mfg. Division, American Chain & Cable Co., Bridgeport, Conn. Available in capacities from 250 to 1000 lb., it is operated by push button control and



is said to be weather proof, dust and acid proof. Furnished for lug, hook or trolley suspension it can be plugged into an electrical line like an electrical accessory. Preformed hoisting cable is used on the drum winding.

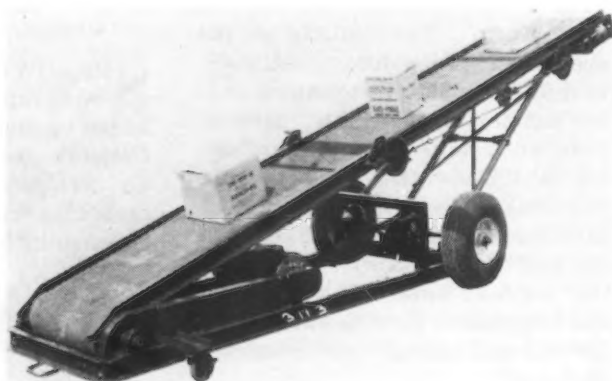
Heavy Duty Hoist

FOR operation from a 110-volt line, the Chisholm-Moore Hoist Corp., Tonawanda, N. Y., is offering a new series of hoists for loads from ½-ton up. Fully enclosed weatherproofed design and airplane type cooling fins are among the features of the new Meteor line. Enclosed hook blocks are employed for extra safety, and the electrical system is protected against overload.



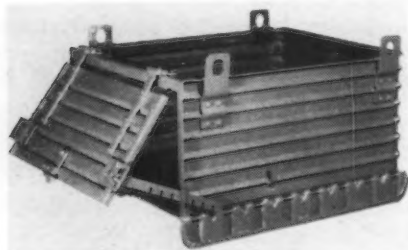
Portable Belt Piler

STANDARD CONVEYOR CO., North St. Paul, Minn., offers a reversible portable belt piler with rubber tired wheels for loading and unloading box cars. A truck can haul it, and it is equipped with rubber coated casters. The carrier is raised and lowered by a crank on the side. This machine has a maximum piling height of 10 ft., a maximum safe piling height of 8 ft., and a minimum of 4 ft. A rough top belting is designed to prevent material from slipping when it is set for the 10-ft. piling height.



Box and Platform Unit

A CORRUGATED steel box and platform unit with a hinged end door for handling small metal parts has been designed by the



Pressed Steel Division of the Truscon Steel Co., a subsidiary of Republic Steel Corp., Cleveland. The bottom of the box is of smooth heavy gage steel so that parts will flow through the door when the box is tilted. A slotted bar adjusts the door opening and permits control of the flow of material from the box. The box can be handled by a forked truck or equipped with tiering or crane lugs.

Skid Platform

FACED with steel restrictions, *Yale & Towne* engineers perfected the Timber-Lock skid platform, a wooden construction said to give all the strength of welded steel. A good part of this strength, the company states, is due to an



interlocking "woodweld" process which ties the supporting runners and deck boards into a unit. Except for the legs and some spiralled helical nails used in part of the assembly, the entire platform is constructed of oak. The Timber-Lock is available in all standard widths and lengths, with plain or armored ends.

Anti-Corrosive Wrappings

LONG ocean hauls on war materials have vastly accelerated the demand for anti-corrosive protective coatings. To help meet this need, the *Riegel Paper Corp.*, 342 Madison Avenue, New York, has extended its line of papers to provide high strength, pliability and moisture vaporproofness in various forms. Some of these new papers are combinations of greaseproof anti-acid glassine, laminated with a special agent to a newly developed anti-corrosive kraft stock.

Transit Cranes

TWO new cranes, of 10 and 20-ton capacities, have been announced by *Bucyrus-Erie*, South Milwaukee. Not only are they convertible from crane to dragline, clamshell, shovel and drag shovel service, but they are also designed for quick conversion from the wheel mounting to standard crawler mounting for occasional jobs inaccessible to wheel type units. They

are equipped with tandem rear axles designed to ensure full traction over rough ground. To simplify maintenance, each unit uses two identical engines, one for propulsion and the other for the hoist.

Air-Controlled Shovel

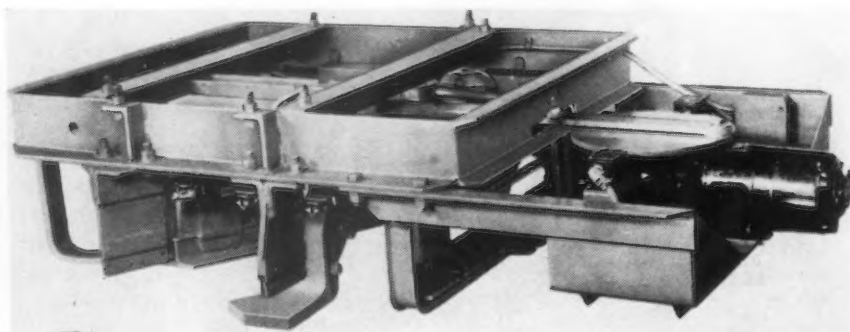
ANOTHER air-controlled excavator and material handler is announced by the *Osgood Co.*, Marion, Ohio. Rated as a 1¼-cu. yd. shovel or a 15-ton crane, it can perform the duties of a shovel, dragline, clamshell, crane or pile driver. Except for the hoist drum brakes, control is by air throughout. Twin Disc clutches engage the swing, travel and retract motions,



giving a degree of control said to closely resemble steam operation. It is available with either conventional crawler mounting or with a pneumatic tired wheel mounting.

Monorail Track Switch

A NEW electrically operated track switch has been developed by the *Cleveland Tramrail Division, Cleveland Crane & Engineering Co.*, Wickliffe, Ohio. It enables the Tramrail operator to pre-set the switch at some distance ahead while traveling, and thus save the time lost when switching

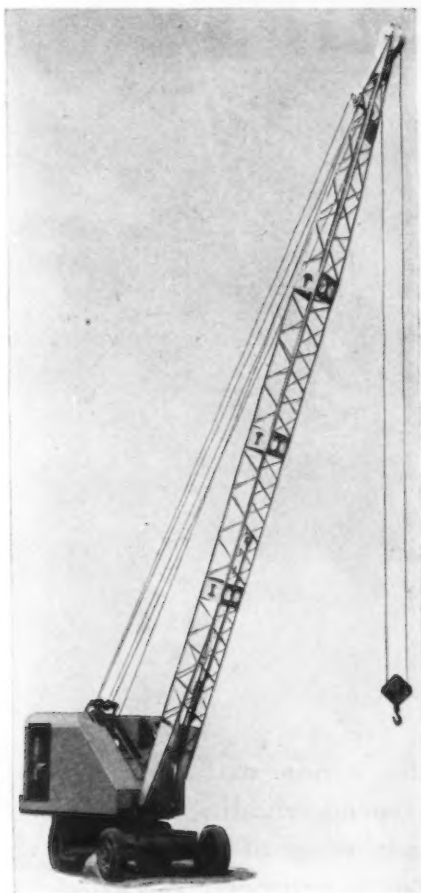


NEW EQUIPMENT

by hand. Likewise, indexes on gravity or automatic dispatch carriers may be set to actuate trippers which will cause one or several switches to take the positions desired. The unit is designated as a motor driven type H switch.

Six-Ton Mobile Crane

DEVELOPED to fill the need for a small mobile crane to travel quickly from job to job, the *Osgood Co.*, Marion, Ohio, now offers a 6-



ton unit for one-man operation. It is powered with a single motor and is said to have a wide range of speeds for traveling, has hydraulic steering and mechanical hydraulic brakes on the rear wheels. Screw jacks are fitted to the rear bumper plate to relieve tires on heavy lifts; outriggers are employed when working over the side.

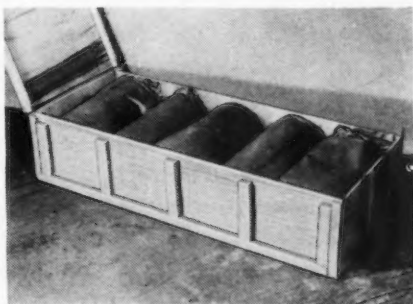
Strapping Tool

A NEW type of stretcher for steel strapping has been announced by the *Signode Steel Strapping Co.*, 2600 North Western Avenue, Chicago. This tensioning tool is said to make possible the tight binding of non-compressible packages and the proper strapping

of those with extremely small surface dimensions. The elimination of the usual "foot," which rests on the surface of the package being strapped, and the substitution of a fork, accomplishes this result in the new unit, which is supplied in two models.

Packing Box

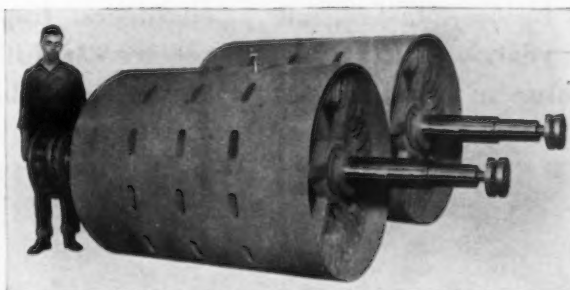
A SAVING of 23 lb. in shipping weight on a package of cold rolled copper was accomplished by using a box designed especially for the purpose by the *General Box Co.*, Chicago. Packing time is saved,



too, it is said, and less nails are used in this construction, which employs selected woods and makes use of reinforcing wires.

Large Magnetic Pulley

STEARNS MAGNETIC MFG. CO., Milwaukee, has recently built two magnetic pulleys, said to be among the largest ever constructed. Weighing approximately 20,000 lb., they are 48 in. in diameter and 64 in. long. Steel cover bands protect the coils and distribute lines of magnetic force over the entire face of the pulley. Cooling is accomplished by air vents which cause the action of the belt on the revolving pulley to draw in and expel air, circulating it around the coil pockets. The interior of the pulley is open for further ventilation.

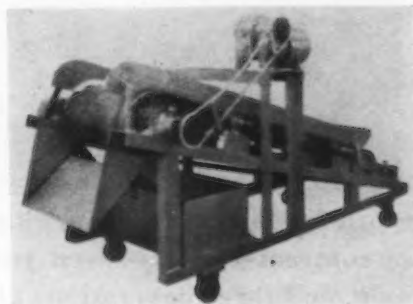


Hoist Control for Blast Furnace

A SMALL motor generator regulator circuit connected in a wheatstone bridge circuit with the exciter field of a variable voltage generator provides an extremely accurate method of controlling the speed of a d.c. motor. The scheme was originally developed by *Westinghouse* engineers some years ago and first used for accurate elevator control regardless of the load carried. Later it was applied to machine tools, hoists, cranes and similar products. The blast furnace hoist hauls a variety of materials of different densities, and if it fails to stop accurately it may either jam or cause a poor distribution of material. The application of the regulating generator scheme slows the skip down to the same stopping speed whether it is hauling coke or ore.

Portable Separator

DESIGNED particularly for reclaiming non-ferrous scrap and for cleaning foundry sand, a portable separator has recently been introduced by the *Dings Magnetic Separator Co.*, Milwaukee. The drive head pulley is a high in-



tensity, air cooled electro-magnetic type with bronze coil covers. The unit is furnished complete with a motor drive and with a motor generator set if required. The inclined design is said to make it easy to shovel material onto one end and to discharge into a receptacle of any reasonable height at the other.

o o o

Faster with each



IT was 1844. Then, as now, the nation faced a crisis. Texas was struggling for independence. Robbins, Kendall and Lawrence, early Vermont predecessors of Jones & Lamson Machine Company, had a contract for 10,000 rifles to deliver in three years. Starting without the necessary buildings, capital or equipment for this work, they built a plant and finished the arms eighteen months ahead of time. Never before had a U. S. Government arms contract been completed so promptly.



NEARLY a century has passed since a group of Vermont machine tool builders first set a new record for fast, accurate work on a national defense contract—ninety-seven years in which these men, and three generations of their direct successors, have never ceased to set new records for rapid, accurate machine tool production—in peace as well as in emergencies.

The significant point today in this unbroken history of hard, exacting work is not alone the length of time it has been in progress, but that the rate of progress has become faster and faster with each successive year.

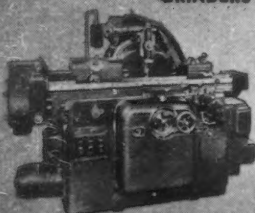
As a result, every machine in the Jones &

Lamson line is today a new machine — with more than enough speed, rigidity and useful power to take full advantage of any hard alloy tools now available or in prospect.

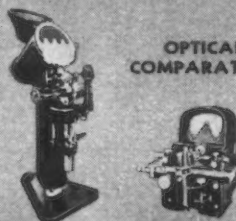
As a result, any plant with equipment and production methods planned by Jones & Lamson engineers is in strategic position to meet today's demands for wartime production and still be ready for the hard years ahead.

That is why it pays in more ways than one to put production problems up to Jones & Lamson engineers. Inquiries from large plants or small receive careful study here, and illustrated catalogs are available.

AUTOMATIC THREAD GRINDERS



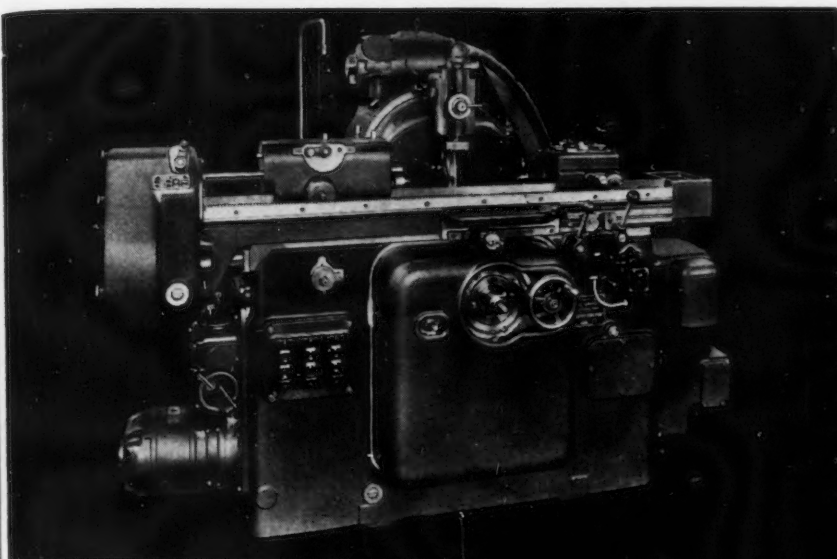
OPTICAL COMPARATORS



RAM TYPE UNIVERSAL TURRET LATHE



succeeding year!



Jones & Lamson Automatic Thread
Grinder, model TG-636 (6 x 36").



Jones & Lamson Automatic Thread Grinder, model TG-1245
(12 x 45").



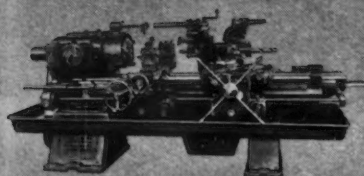
PROFIT PRODUCING
MACHINE TOOLS

JONES & LAMSON

MACHINE COMPANY - SPRINGFIELD, VERMONT, U. S. A.

MANUFACTURERS OF: RAM & SADDLE TYPE UNIVERSAL TURRET LATHES . . . FAY AUTOMATIC LATHES . . . AUTOMATIC THREAD GRINDING MACHINES . . . COMPARATORS . . . AUTOMATIC OPENING THREADING DIES AND CHASERS

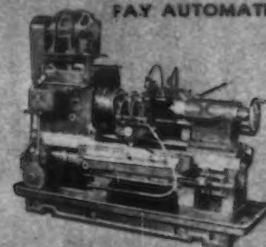
SADDLE TYPE
UNIVERSAL TURRET LATHE



AUTOMATIC OPENING
DIE HEADS

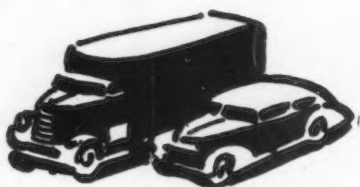


FAY AUTOMATIC LATHES



Assembly Line . . .

• UAW-CIO take G-M contract demands for payraise, union shop to Washington after meaningless negotiations . . . Petty union squabbles cause delay at new Willow Run bomber plant.



DETROIT — They planned it that way, so UAW-CIO leaders are taking their General Motors contract demands to Washington to be settled by the War Labor Board.

Yes, they planned it that way, and more than a month ago when General Motors proposed that contract negotiations be opened to the press, Walter Reuther, director of the union's GM Division revealed that the union expected the final settlement to be made by Washington, rather than by negotiation.

The corporation had asked for continuation of negotiations for a longer period here, expressing the belief that settlement of more points was a possibility.

Perhaps if the sessions had been opened to public scrutiny, there wouldn't have been this period of more than a month of dickering, with the only final result chalked up as the settlement of "a few minor points."

The question whether the WLB hearings will be open to the public apparently will be settled by the board itself.

Incidentally, the WLB, in taking on the job of settling terms of the GM contract, is handling its biggest case to date, possibly the biggest it will even be called upon to handle. Terms of the settlement will immediately effect about 200,000 employees in approximately 90 plants, and will be reflected very shortly in Chrysler contract negotiations, which undoubtedly will follow the pattern established in the GM case.

Effects will be more far-reaching than even that, however, since the widespread GM production plants are closely tied up with other war production units throughout the nation.

Two vital questions to be settled involve the NXX union's demand for a union shop and for an increase of \$1.00 a day in wages.

Recent WLB action indicates its policy is one likely to impose a "maintenance of union membership" clause on GM, and therefore on other automotive firms. This freezes the unions membership at the present figures as a minimum, and then gives the union free rein to corral other workers.

LAST year, when the contract dispute went to Washington for settlement, the union was granted a 10c. an hour increase, estimated as amounting to \$35,000,000 a year. The present demand, if granted, would cost the company approximately \$90,000,000 a year, which would immediately be reflected in the cost of war goods to the nation.

Other demands which remain to be settled include a union demand for a 20 or 30 minute paid lunch period and a \$100 defense bond in lieu of vacations. Also at stake is the question of paying double time for the seventh work day. The union executive board has instructed local unions to reword local contracts to surrender premium payments for weekend work, as such, when the 40-hr. work week is not exceeded but still UAW wants double-time for the seventh day. GM is understood to have expressed a willingness to pay time and a half for the six and seventh consecutive work days but has balked on paying double time for the seventh day.

In recent weeks nothing has been heard about the GM proposal for a return to some form of incentive payments to insure higher war production. The trend against wage incentives has been so strong in recent years, due to union opposition, that the proposal itself could probably be best regarded as a thought-provoker rather than a corporation demand anyhow.

Actually the agreement between General Motors and the UAW expired on April 28 and there is no distinct provision in the contract

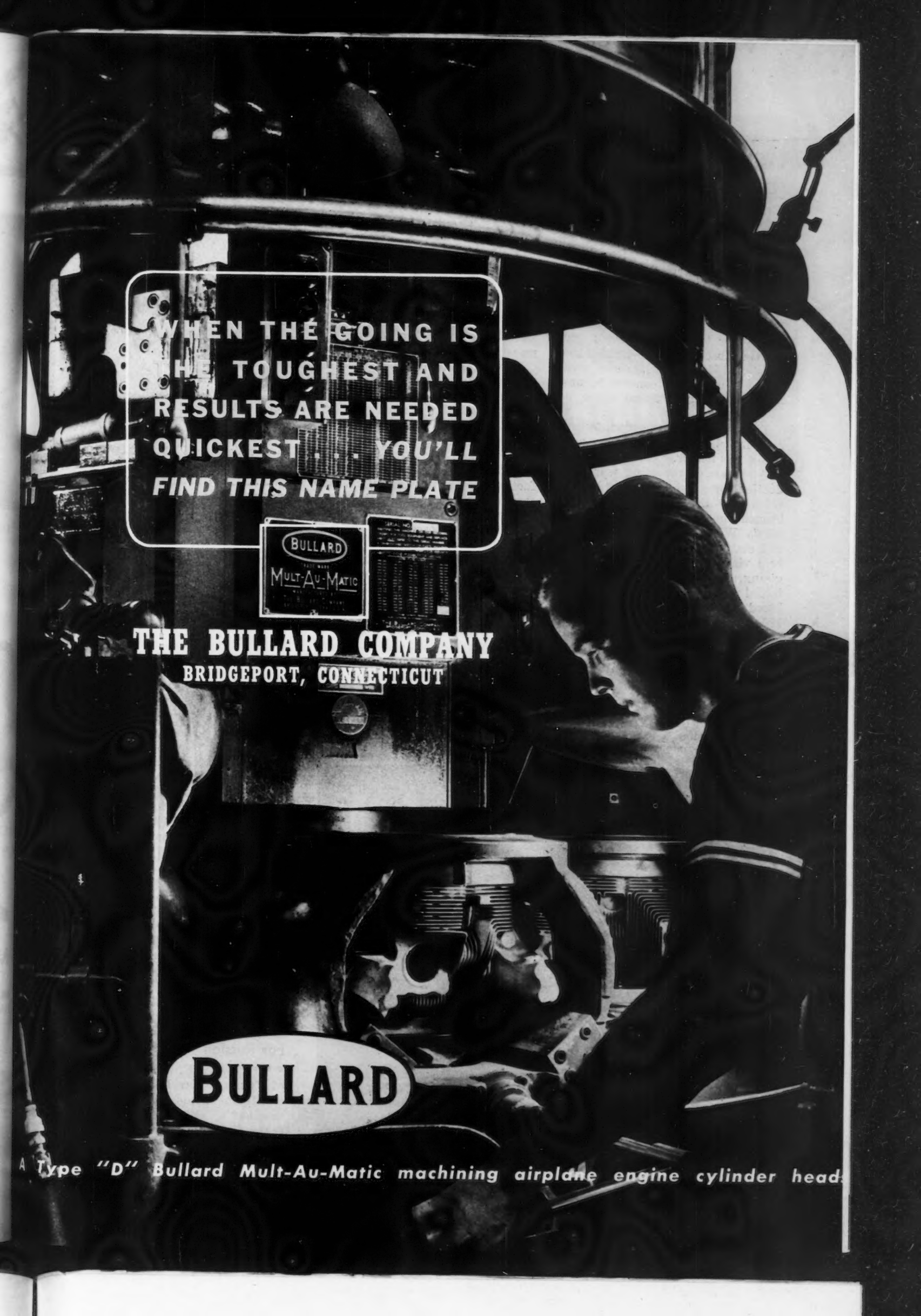
for continuance, but GM is continuing to respect all the terms of the agreement, pending a new settlement.

It should long since have become apparent that "things are not what they seem" and that such prolonged negotiations as these really don't mean a thing. In this instance that UAW went into the negotiations with the expressed idea that settlement would finally be made in Washington anyhow and that little or nothing would be accomplished in the meetings here. Those who attend such meetings (the press being barred) confirm time after time the idea that the negotiations seldom stay long on a path directed toward settlement. There is a great deal of aimless conversation, of rehashing old grievances, and of expounding pet theories or pet themes. Only occasionally does the conversation head down the line toward settlement of any point in dispute. In this case, in the words of the federal labor conciliator, James F. Dewey, the points settled were few and minor.

How serious the union considers such negotiations can be attested from a first-hand report picked up in conversation with a union committee man in one of the tool and die plants. He was planning, he said, to get a new suit of clothes shortly "to go to Washington again this spring." Last year the negotiating committee enjoyed several airplane trips to Washington and return, saw the cherry blossoms in bloom and visited all the sights while some board or other virtually wrote the contract as suggested by the union leaders. This year, even before contract negotiations had been opened, committee men were planning on their annual spring hegira.

Pragmatically, some people wonder why the union doesn't come out in the open and lobby for a set-up that would automatically shift all negotiations to Washington. It would save a lot of conversation, as the union apparently doesn't want to try seriously to negotiate to any successful agreement anyhow.

Recent experiences at Willow Run have indicated that a closed shop contract and wages running up to \$1.65 an hour don't keep peace in the family. Many suppliers have found that their goods are tied up



WHEN THE GOING IS
THE TOUGHEST AND
RESULTS ARE NEEDED
QUICKEST . . . YOU'LL
FIND THIS NAME PLATE



THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT

BULLARD

A Type "D" Bullard Mult-Au-Matic machining airplane engine cylinder head.

at the gates to this gigantic national war production plant by petty union squabbles. One instance that is quite typical of many that have occurred, is the supplier whose equipment for airplane production reached the gates but was not permitted inside because the union wouldn't handle a piece of equipment not assembled by union members. After a lot of haggling it was agreed that, if UAW members in the Ford plant could take off one or two small gadgets and put them back in place—tighten the nuts and bolts with their own hands—they would consent to unload the equipment and move it into the plant.

This sort of thing frequently results in delays of several hours and sometimes longer.

A system of reporting war production progress has been instituted by the WPB automotive branch in conjunction with Stacy May's WPB division of research and statistics. This is intended to help visualize war output without giving away military secrets. The initial report was released recently, based on statistics gathered from 180 companies operating about 600 plants and representing 85 per cent of the automotive industry (based on labor). These show that in February these companies were com-

mitted to the production of war goods at a rate of more than \$14 billion worth a year and that in that month output had reached a rate of 22½ per cent of that goal. The February production was \$266,000,000, which is at the rate of more than \$3,000,000,000 a year. This rate will, of course, be accelerated as tooling programs are completed and production gets underway. In addition, many of the projects now called "in production" are actually only in the pilot stages of mass production.

The automotive branch also discusses "value added" figures, those representing work actually done in each of the plants reported. This figure is reached by subtracting from the total sales the cost of raw materials and any parts supplied by sub-contractors or any other manufacturers. On that basis, the 180 companies are committed to a war load in "value added" at the rate of \$7,000,000,000 annually. In contrast, the 1941 peak rate was more than \$4,000,000,000 annually on both war and civilian goods. This figure represents the peak month multiplied by 12 and does not represent the actual total. In terms of "value added" the February figure is \$136,000,000 which is at the annual rate of \$1,500,000,000-plus.

These two WPB branches—auto-

motive and the research and statistics divisions—are currently trying to work up a standardized form of a report which will be of general value and interest. The sales figure is the one that strikes the public fancy but the value added figure of production hours are of more real concern to industrial analysts. Shortly it is expected a standardized form will be adopted with March and April figures conforming.

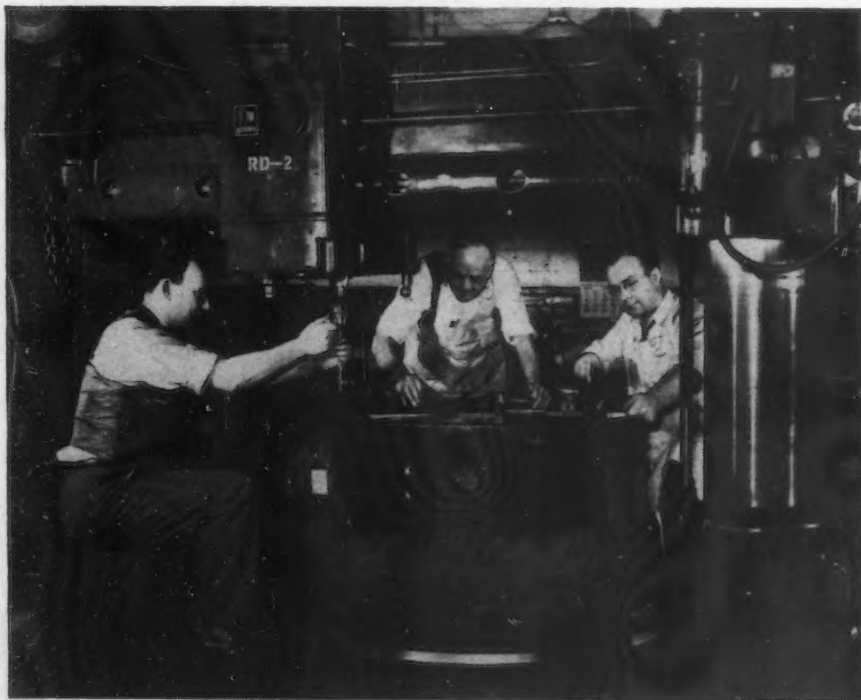
Last week Ernest Kanzler, director of the WPB Detroit Region and the Automotive Branch, issued a warning to 25 automobile firms against discrimination in the employment of workers in war plants because of race, creed, color or national origin. He declared that this is a violation of national war policy. Kanzler himself did not declare that such discrimination existed but said: "It has been brought to my attention by representatives of the Negro Employment and Training Branch and the Minority Groups Branch of WPB" that barring of such workers has been practiced.

Inter-racial difficulties had another point of interest for industry last week when Michigan's Home Guard Troops, recruited after the National Guard was called into the Army, was called to Detroit to stand guard while the government moved negro families into a Federal housing settlement, over the objections of nearby residents. Far out in the state industrial plants two, three or a dozen employees, many of them key men, not reporting to work because they had suddenly been called to Home Guard duty in Detroit. This was a surprise to many employers and to many of the Home Guard volunteers since they had quite generally been under the impression that their duties would be restricted to the immediate vicinity of the home cities. One plant, in particular, reports that its operations were subject to considerable interference as a result of this sudden calling of a group of key men.

U. S. Steel Gives \$75,000 For Russian War Relief

• • • Edward C. Carter, president of Russian War Relief, Inc., this week announced his agency had received a contribution of \$75,000 from United States Steel Corp.

TANK PRODUCTION: These tool and die men in a Fisher Body Co. plant are building a fixture for machining a tank turret. The fixture will be similar to many used in automobile production, but will be much larger.



**WITH BULLDOG
BUSTRIBUTION DUCT**

YOU CAN PLUG IN YOUR MACHINERY

As Easily as You Plug in Electrical Devices at Home

MACHINES never need stand idle, waiting for power — if your plant is equipped with BullDog BUStribution DUCT.

Whether you are building a new plant or converting an old one, power is ready *where* you want it, the minute machines are placed. Just plug in as simply — as easily as you connect a home electrical device.

The Pioneer — and Still the Leader

BullDog originated this *completely flexible* method of power distribution—and no other system today gives you the combination of advantages you get from BullDog BUStribution DUCT.

BullDog equipment is easily installed, easily moved. It is 100% salvable — has high asset value. **And its use conserves critical materials such as rubber, copper and aluminum.**

No wonder hundreds of U. S. plants, large and small, are choosing BullDog Flexible Electrical Distribution Systems in this war emergency—to save precious production time, cut maintenance cost, assure maximum safety and operating efficiency.

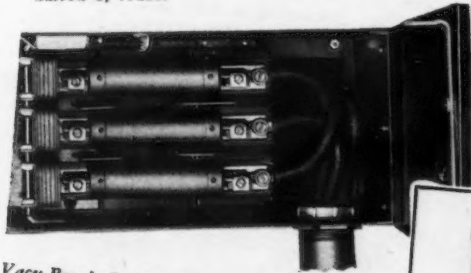
Expert Engineering Service at Your Disposal

BullDog gives another advantage you can't get elsewhere — the services of a corps of field engineers, trained to help solve the problems of electric light and power distribution in mass production industries. These men—situated in more than 30 conveniently

located cities — are ready to advise you, assist your architect or contractor, or take the job of designing and installation entirely off your hands.

Write for full information regarding the two types of BullDog BUStribution DUCT—"Plug-in" and "LO-X" (low reactance)—as well as BullDog Universal and Industrial Trol-E-Duct for mobile lighting and power.

Run of 750-ampere "Plug-in" Type BUStribution DUCT in a large war production plant. Note individual protective plugs for each machine. Plugs are easily and quickly movable from one part of the system to another to take care of new loads or combination of loads.



Vacu-Break Switch Plug, with cover open, allowing access to fuses. Horsepower rated, quick make and quick break. Capacities up to 600 amperes. The three types of BullDog protective plugs—circuit breaker, disconnect and operating switch—are standardized and interchangeable, and are offered in a wide range of capacities.

BULLDOG
ELECTRIC PRODUCTS CO.

DETROIT, MICHIGAN

BullDog Electric Products of
Canada, Ltd., Toronto, Ontario



ORIGINATORS OF FLEXIBLE ELECTRICAL DISTRIBUTION SYSTEMS FOR LIGHT AND POWER

Washington . . .

• Government's policy on freezing of wages, following price fixing, still indefinite . . . WLB Chairman Davis says "adjustments to iron out inequalities" will be made . . . Steel, aluminum, shipbuilding wage cases now before board.



WASHINGTON—In his fire-side chat last week, President Roosevelt told wage earners:

"You will have to forego higher wages for your particular job for the duration of the war."

This appears to be a policy of overall freezing of wages. But actually it is not. That it is not is seen from the President's message to Congress in which he spoke of "stabilization" of wages on a voluntary basis and not by legislative fiat. The job of stabilizing was left to the National War Labor Board. The President said, and many in Congress disagree, that legislation governing wages "is not required under present circumstances." He went on to express the belief "that stabilizing the cost of living will mean that wages in general can and should be kept at existing levels." He had previously said that if the objectives set forth in his seven-point anti-inflation message were not attained "and if the cost of living should continue to rise substantially, I shall so advise the Congress and ask for any additional legislation which may be necessary."

This latter statement was interpreted to mean, among other things, that if labor does not voluntarily accept WLB adjustments the President will ask for legislation to continue wages. Just now the farm

bloc in Congress, hostile to the President's proposal to reduce farm prices to parity, seems determined to resist scaling down of the 110 per cent parity level unless the Administration establishes a definite legislative policy on wages. There is also considerable Congressional opposition to the President's proposal to limit net incomes to \$25,000 a year.

Congressional opposition the past nine years has had a way of quickly dissolving into nothing. Whatever compromises, if any, the President may accept respecting farm prices and a limitation on incomes, it is not believed he will yield in the slightest to Congressional demands for a definite legislative labor policy.

ALREADY proposed labor legislation has been laid aside at the request of the President and the WLB has taken up the task of fixing a policy to "stabilize" wages. Since the board majority has gone a long way in granting what organized labor has asked, it is to be definitely expected that it will grant wage "adjustments"—that is, wage increases.

Organized labor obviously has set its wage demands at higher figures than it has expected to get. Then when the increases are set below those demands organized labor can assume the position of "sacrificing in the interest of the war effort."

The pattern for the WLB policy

of wage adjustment under the President's program was discussed on Wednesday of last week by the board with officials of government agencies and members of labor committees of Congress. An inter-departmental committee was organized to continue discussions. At a subsequent press conference Chairman William H. Davis of the board said that the board will "continue to make upward adjustments to iron out inequalities and sub-standard pay situations." He added that the board will put a stop to further increases in wages that it now considers as "standard." He did not say what a standard wage is.

Naturally Mr. Davis declined to say what effect the President's position as to a wage policy will have on board decisions in the principal cases now before it, in which CIO is asking for a \$1 a day wage increase. These include "Little Steel," Aluminum Co. of America, Bethlehem Shipbuilding and General Motors. These cases concern well paid workers. It would appear that under the President's formula the matter of granting or not granting wage increases would rest on the question whether the rise in the cost of living since the last wage contracts justifies increases.

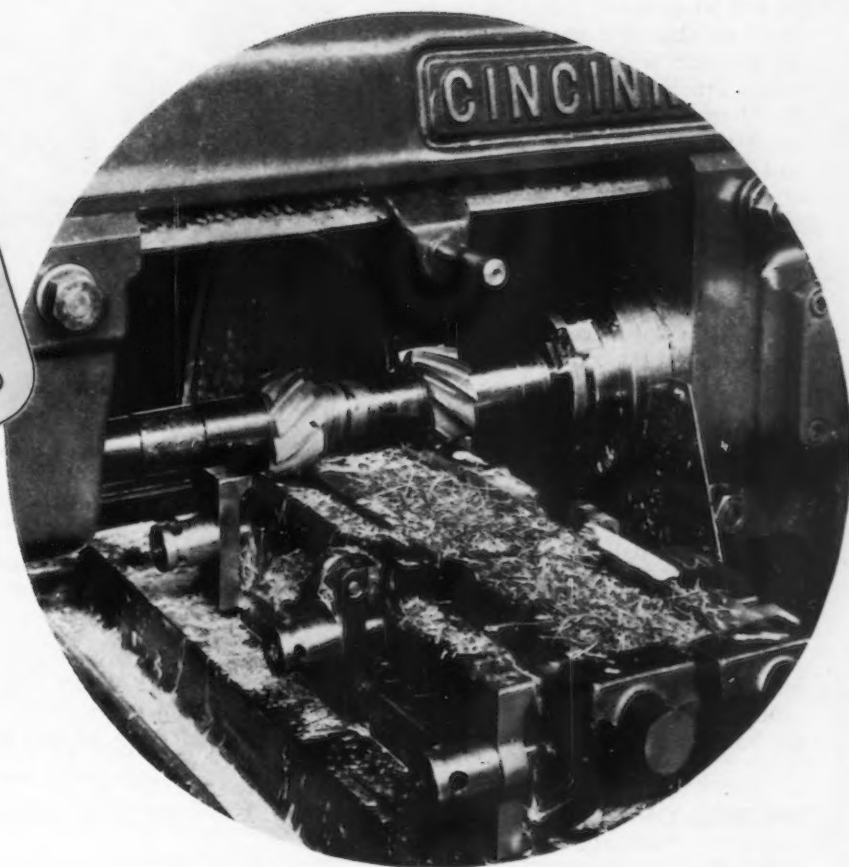
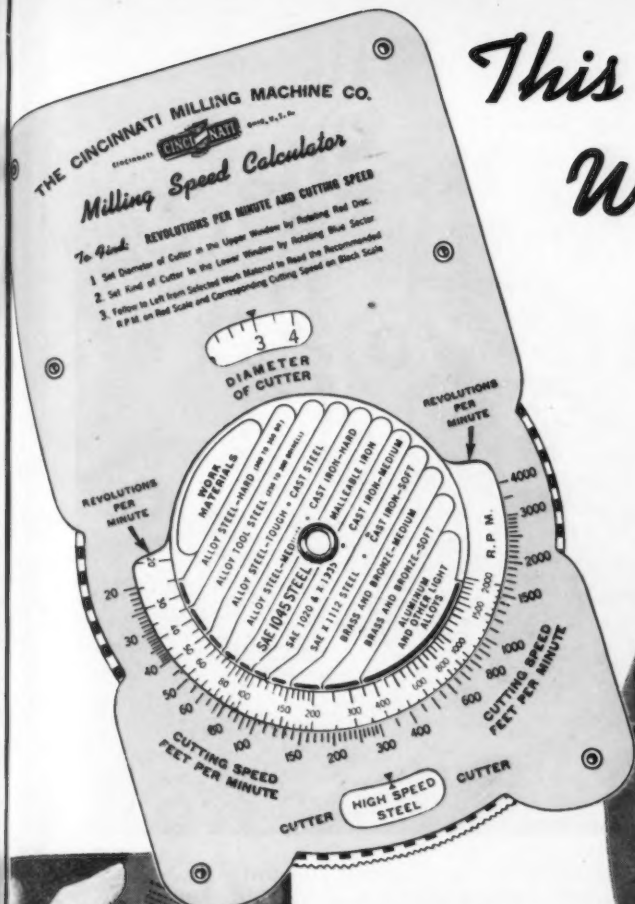
The first case for determination is "Little Steel" and consequently it is expected to set a precedent for the board's future "wage adjust-

ALL OUT FOR WAR BONDS: Workers in the Tool Steel Department of Bethlehem Steel Co., at Bethlehem, Pa., attained a 100 per cent goal in the purchase of war bonds. For the entire plant, the average is about 96 per cent.

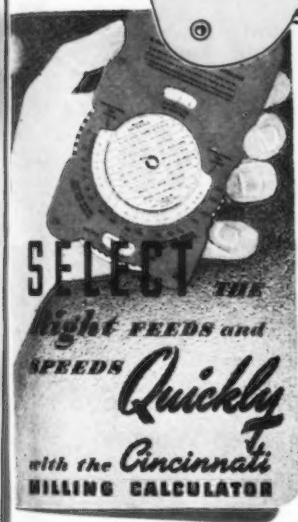


This Calculator Will Help You

KEEP 'EM CUTTING!



Calculator
and
Instruction
Book
50 CENTS



MAIL THIS COUPON

THE CINCINNATI MILLING MACHINE CO.
Marburg Avenue,
CINCINNATI, OHIO

Please send me one Milling Speed and Feed
Calculator. Enclosed you will find 50 cents

in coin.
check
money order
stamps } to pay for this device

Name _____ Title _____

Company _____

Send to Company Address, Home Address (cross out one)

Street _____

City _____ State _____

There's nothing more discouraging to production men than to see a set of expensive cutters broken while in use, or to hear that a machine has been shut down because of mechanical or motor failure induced by overload. Many of these delays can be eliminated by merely using the right feed and cutter speed.

In milling, these two fundamentals of production can be selected quickly with the CINCINNATI Milling Speed and Feed Calculator. Then too, it's just as valuable at the other extreme of production, wherein machines and cutters are run over-cautiously slow.

The Calculator is a natural outgrowth of our efforts to build milling machines which are easy for the average man to operate, to make him feel sure of the accuracy and finish he can obtain. Consider the CINCINNATI Nos. 2-18 and 2-24 Millers, for example . . . automatic spindle stop; single lever cutting cycle control; safety cutout switches at gear change stations. Complete specifications may be obtained by writing for catalog M-965 (for the Plain Automatic Machines) or M-909 (for the Automatic Rise and Fall Machines).



THE CINCINNATI MILLING MACHINE CO. CINCINNATI, OHIO, U.S.A.

TOOL ROOM AND MANUFACTURING MILLING MACHINES... SURFACE BROACHING MACHINES... DIE SINKING MACHINES

ment" policy under the President's program. This has caused a revision of the heretofore existing view that all SWOC workers would be given an hourly increase in wages. The general opinion has been that a 5c. an hour increase would be granted. But it is now believed that the increase will not be granted workers in the higher wage brackets but will be allowed for those getting less than a "standard" wage. The undefined standard is expected to be high since the basic wage in steel is 72.5c. an hour. The average pay of steel wage earners is \$1.001 an hour. This is a wage increase of 15.5 per cent since 1939 compared with a steel price increase of only 1 per cent. Manifestly it is not possible to say what wage groups in steel will be granted a wage increase, but it is the common assumption that increases will be granted and that they will set the pace for wage advances in other big as well as small industries where high wages already prevail.

MR. DAVIS' closest definition to a standard wage is one that is arrived at by "real collective bargaining." Wage increases of 10c. an hour in steel became effective



EMPLOYEE-MANAGEMENT GROUP: At Douglas Aircraft Co., Santa Monica, Calif., employees and management pool their skill, knowledge, and experience to speed production that spells victory. This group is functioning earnestly and efficiently to further increase the fighting morale of the production troops in the plant.

on April 1, 1941. By this increase a basic rate of 72.5c. an hour was granted common labor. Should this rate and even some of the higher

rates become substandard, in the view of the board, by reason of the rise in the cost of living, the policy would be to grant increases and that is what it is generally expected to do.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



White Sewing Machine Corp. 40 Per Cent on War Work

Cleveland

• • • The White Sewing Machine Corp. has war contracts amounting to 40 per cent of the company's capacity, according to A. S. Rodgers, president. It would take two or three months to convert the company to 100 per cent war work, he said. The company earned \$232,255 for the first quarter of 1942, compared with \$214,235 in the initial 1941 quarter.

"E" for 3 American Brass Plants

• • • The Navy awarded an "E" for excellence pennant on May 6, to three Connecticut plants of the American Brass Co. The plants are at Torrington, Waterbury and Ansonia, all in Connecticut, and for the Navy manufacture primarily copper-nickel condenser tubes for fighting ships, tubes for salt water lines in these ships and condenser headplates.

THIS IS THE STORY OF CARBOLOY

How a Most Strategic Material of the War—Invented in Germany—Was Made Available to the United Nations



More Precious Than Diamonds in War Production . . . Carboloy is an American trademark for cemented tungsten-carbide, an alloy second only to diamonds in hardness, more precious than diamonds as a vital material in America's war program. It is used for the tips of cutting tools, and for wear-resistant dies. Carboloy is used in small quantities; it is difficult to make and difficult to use—but it has never been scarce in modern times. There is no scarcity now.

Invented in Germany—Krupp Protected by U. S. Patents . . . Cemented carbide was invented in Germany—it belonged to Krupp of Germany, and this made all the rest of the world Krupp's customer. In this country, Krupp was protected by patent grants from the United States.

General Electric Creates Independent Production . . . The General Electric Company two years before this had begun research on tungsten-carbide and foresaw its importance in industrial production. For immediate use in its own plants and for easier availability to others, General Electric undertook the long and arduous negotiations for the American rights. Limited rights were obtained in 1928, with Krupp continuing to export the material to its United States customers—a business which languished, however, as General Electric painstakingly developed its own Carboloy technique. This paved the way for General Electric to make the United States entirely independent of Germany for its cemented tungsten-carbide supply as early as 1936.

American Tool Costs Half That of German . . . From the start, two totally different businesses were involved. Krupp originally exported cemented carbides in

chunks—and was unsuccessful. General Electric—and its subsidiary, Carboloy Co., Inc.—found it necessary to develop a complete engineering and manufacturing service, making various types of Carboloy equipped tools, training men in their use, and offering to its customers a specialized and successful production technique. For purposes of fair comparison, a typical German cemented carbide tool in 1928 cost \$22.26 in the United States, while a comparable American Carboloy tool cost \$11.11.

Loss to General Electric for Many Years—Art Taught to Industry . . . In times of peace—and 1928 was such a time—the measure of success of industrial adventure is to be found in profit to the adventurer. By such a measure, Carboloy could not be called successful. Initial expenses were great. For a time the Company lost at the rate of \$1000 a day, and once had an operating deficit of more than a million dollars.* One of the major contributing reasons was the continuing high cost of development, standardization, and training. In 1936–37 alone, training courses were given to 10,000 men in industry. Moreover, six major price reductions were made in the face of operating losses, until the standard tool blank had been reduced in price 90 per cent.

Faith and Perseverance . . . Depression was still another reason—labor-saving tools could not be sold to industry or labor at any price. But General Electric, with determination that now seems providential, kept on—increasing its

capacity, granting new licenses, condoning instances of unlicensed production, staying ahead of its market.

Production Multiplied Forty-five Times in Four Years . . . Cemented tungsten-carbide could easily have been a source of weakness here, as it was in England, had it not been for General Electric's policy of continued expansion. In 1939, the production of the Carboloy Company was less than 20,000 lbs.; in 1940, it was 55,000 lbs.; in 1941, it was 163,000—and in December came Pearl Harbor. Now, in 1942, the Company's production is going at a rate that is 45 times that of only four years ago.

Britain Dependent upon Us . . . By contrast, British companies, which had been content to continue as customers of Krupp, found themselves cut off from the vital material when Poland was invaded. But the General Electric Company was able to supply substantial quantities to British industry immediately and since then has continuously filled British orders. It has, in like manner, filled Canada's requirements since 1936. It is currently supplying Canada, Russia, and other United Nations. All this in addition to supplying the greatly expanded needs of American industry.

An Inspirational Story of American Industry . . . Thus, the story of Carboloy does not end in "too little and too late." Like many previously untold stories of American industry, it continues, a sturdy and inspiring example of public service born of private enterprise, and characterized by hard work, ingenuity, investment, research, risk, and courage—a familiar pattern on this side of the Atlantic. *General Electric Company, Schenectady, New York.*

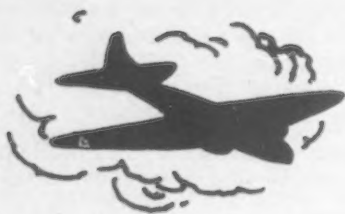
*Over the entire period of its existence up to January 1st, 1942, the total net profit of the Carboloy Company was 2.5 per cent of sales.

GENERAL  ELECTRIC

912-7225

WEST COAST . . .

• **Expert CIO organizer arrives on Coast to unionize plane plants, warns industry of growth, higher wages at Detroit . . . Aircraft builders act to prevent shortages at one factory while another has excess of material.**



SAN FRANCISCO—Flushed with success at successfully organizing Ford workers in Detroit, William B. Taylor, famed CIO-UAW organizer, has arrived on the Coast to bring the CIO's brand of salvation to southern California aircraft workers.

Number One nut which Taylor hopes to crack is Douglas Aircraft Co. Workers at Douglas' big Santa Monica plant, the smaller El Segundo plant, and the huge blackout plant at Long Beach, where the paint is still fresh, heretofore have struggled along at their job of building airplanes without benefit of any form of unionization. This uncivilized state exists not for lack of effort to organize them—many attempts have been made during the past two years—but because no organizer has had sufficient skill to glue the unionized fragments into a disciplined unit. Small CIO "cells" exist at Douglas but they are almost minute and are static.

Whatever may be their justification, Douglas employees although resisting unionization, have not given this columnist to believe that they are entirely satisfied either with relative wages or working conditions. The company has not combated organization of unions in its ranks, but on the other hand has made it clear that it will not deal with them until it has to. In this situation the UAW thinks it sees

fertile ground and will attempt to nurture its organizational seeds.

TAYLOR plans to use as his base of operations aircraft plants in the vicinity which are already organized—North American, Vultee and Lockheed-Vega. Although the latter has an AFL bargaining agent, its union leaders are apparently behind the CIO drive to organize Douglas. Strangely, the AFL is making no concerted attempt to organize Douglas just at present.

The union is frank about its objectives and the methods and weapons it will use to get them.

Explaining that at Ford's Willow Run aircraft plant workers are getting the same wages that Ford paid his automobile workers, Taylor explains that "the average hourly rates for aircraft workers there is \$1.16 as compared with 75c. or 80c. an hour on the Coast." That indicates the level at which his sights are set in the Douglas drive, and if Douglas accepts the higher rate, the heat will be on the rest of the industry. If the UAW can succeed in establishing this precedent for labor rates it will be one more step in tying the Pacific Coast's insular economy in with the rest of the country.

METHODS used to organize the workers will consist of house to house canvassing, use of radio and publicity, and a system of "volunteer" organizers. Many of the volunteer organizers will be drawn from already organized plants, for as long as Douglas remains unorganized it is a weak link in the strength of the unions throughout the industry.

A hint as to the possible weapons that will be used lies in Taylor's inaugural statement as director of the drive:

"Ford, which will soon be turning out a plane every hour, will revolutionize the industry. Unless the Coast manufacturers catch up with Ford, they will be left holding the bag." When an industrial engineer makes a statement like that, he is referring to production methods. When such a statement comes from a labor man, it could be a threat of a slowdown.

Taylor goes on to say, "We bring to the unorganized Douglas workers the benefit of our organization. We bring to the Douglas management our experience in organization and our productive ingenuity. This is no idle boast." In other words, the price of productive ingenuity seems to be organization.

WAGE demands in the CIO's spring drive are not necessarily incompatible with the WLB's announced intention to "stabilize" wages. Management, as the price of speeding up production, can increase wages voluntarily without even taking the problem to the War Labor Board. This does not even necessarily mean that the unit price of planes to the government will be raised. In many plants increased efficiency and large scale production is decreasing unit manufacturing costs. Rather than giving this saving back to the government in the form of reduction on contract price, it can be given to the workers in the form of wage raises. It's Uncle Sam who pays.

CIO's Harry Bridges explains how to reconcile such statements as "let's remember we have only one enemy now and it isn't the employers of American labor. . . . The thing that matters now is winning the war," with demands for increased wages. He argues that if increased wages raise the workers' morale, make it possible for them to live better and hence to work better, that is helping to win the war.

AMORE immediate contribution to stepping up aircraft production was acknowledged last week at a Hollywood meeting of procurement representatives of southern California aircraft plants, representatives of the Army and Navy Munitions Board, and of the War Production Board. The meeting was sponsored by the Aeronautical Chamber of Commerce, and dealt with the aircraft industry's version of a production requirement plan designed to correlate the flow of materials with periodical aims. The aim would be to make it impossible for material of one type to pile up at a certain plant while its neighbor plant was forced to curtail production for lack

THE BIG

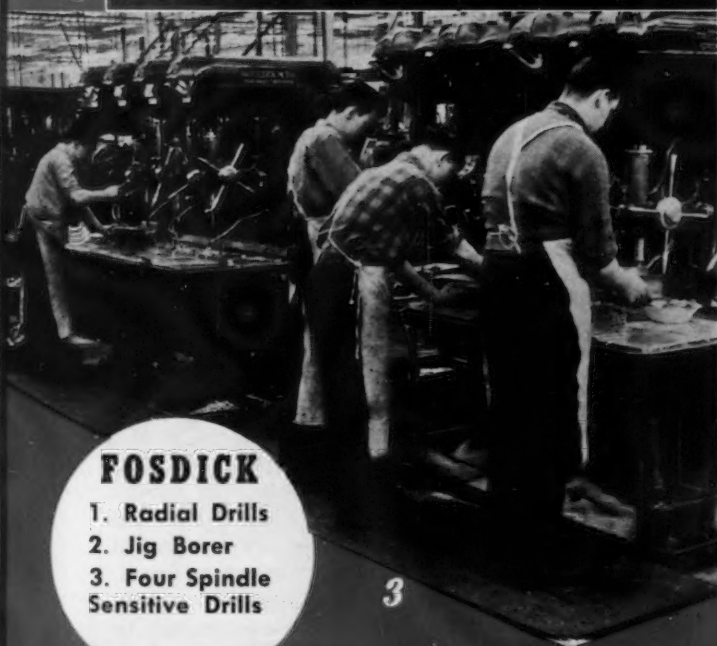
3

IN AIRCRAFT
PRODUCTION

1



2



FOSDICK

1. Radial Drills
2. Jig Borer
3. Four Spindle Sensitive Drills

3

FOSDICK

RADIALS • JIG-BORERS AND SENSITIVE DRILLS

In stepping up aircraft production to meet the unprecedented demands of our air forces and those of our allies requires the services of modern machine tools in greater volume than ever before dreamed of.

Here's evidence of how Fosdick is meeting this challenge in one of America's foremost airplane plants. Fosdick Radials—Jig Borers and Sensitive Drills strategically located throughout the plant are doing their share to meet the enormous production required—in a limited space of time.

The Radials are drilling and reaming caps for cluster fitting a steel forging. . . . The Jig Borer is drilling holes in gusset center section rib and can hold accuracy within .0002 to .0005 inch. . . . The battery of four spindle sensitive drills is handling miscellaneous drilling work where successive operations are performed in one set-up.

When your work requires drilling, reaming, boring and similar operations on an economical production basis, investigate Fosdick Radials—Jig Borers and Sensitive Drills. Bulletins upon request.

FOSDICK

MACHINE TOOL COMPANY
CINCINNATI • • • OHIO

of the same type of material. Such situations have been the subject of much publicity, but nothing definite has ever been said as to the interchangeability of units and materials affected.

At a San Francisco meeting last week, James R. Moore, vice-president of Moore Dry Dock Co., Oakland, Cal. shipbuilders, defined five points as the knottiest problems confronting the yards currently:

1. The expansion of the average year from peacetime levels of a few hundred men (or none whatever) to tens of thousands.

2. The inadequacy of the supervisory force in relation to the number of new employees.

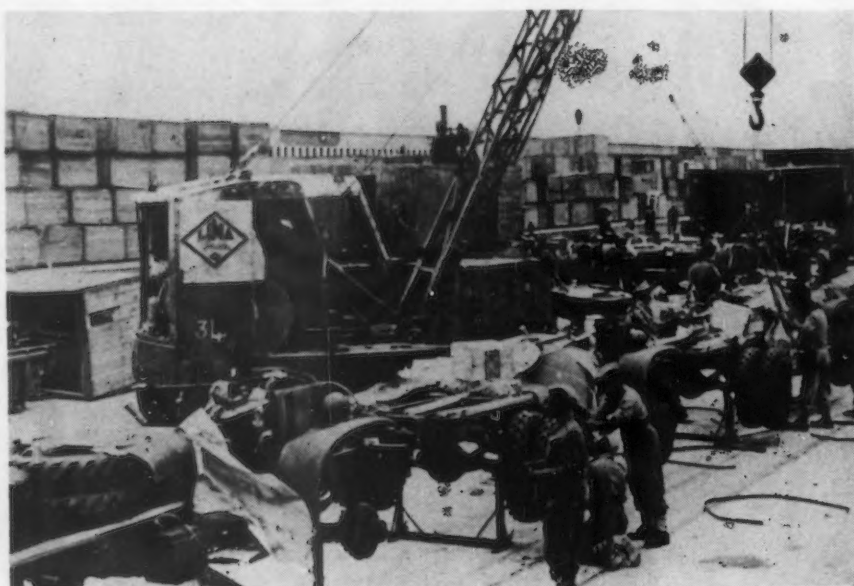
3. Uncontrollable delays in the delivery of materials and equipment.

4. The fact that supervision in shipbuilding constitutes a far more difficult problem than in the average industry because of the difficulty of access to the various holds, tanks, compartments, accommodation spaces, etc.

5. The inevitable delays involved in preparing for and performing a job in an inaccessible portion of a ship where, in some cases, the services and equipment of four or five different crafts are required, and where occasional waiting on the part of one or more of the crafts represented is almost unavoidable.

NOT included on this list, and possibly constituting a sixth problem, is that encountered at the yards handling both new work and repair and conversions. The problem of dovetailing conversion and repair work into labor and material requirements for new work, together with the uncertainty of obtaining materials, is one which is not easily overcome.

Some slackening in the overall rate of increase of industrial activity in the Twelfth Federal Reserve District (Pacific Coast States) was indicated in the Federal Reserve Bank's report covering the month of March. The bank stated that "war problems faced by individual manufacturing industries are emerging with greater frequency and are also becoming more critical. These problems are varied in character but among the more important are those arising from shortages of material, skilled labor, power, and transportation and machine facilities." Of this group, shortages of power and transportation



British-Combine Photo

U. S. SUPPLIES TO EAST: In spite of the enormous demands for war equipment in the Pacific, large shipments of supplies are moving into the Middle East. These crates of American truck parts are taken ashore and assembled on the dock, ready to go into action.

are probably the most ominous for the future. The entire light metal and ferro-alloy industry growing up in the Pacific Northwest is dependent on power. Two huge hydro-electric generators contracted for California's Shasta Dam are being transferred to Grand Coulee to meet this demand. The transfer will increase the Grand Coulee output sufficiently for production of 125,000,000 lbs. of aluminum. The Department of the Interior feels that it can make this change and still bring Shasta Dam into power production on schedule late in 1943.

RUSTLESS Iron & Steel Corp. is reported to have WPB and RFC approval for construction of a plant in Oregon, presumably for the production of ferro-chrome and using local ores.

The State of Washington has made an appropriation for Washington State College to conduct research into possibilities of utilizing low grade manganese deposits.

In the Puget Sound area, an increased flow of scrap from automobile graveyards is reported by dealers with consequent improvement in the steel production outlook.

Efforts of the Army to save steel are indicated by the building of three 200,000 gallon reinforced concrete water tanks at Fort Lewis, Washington. The tanks are 30 ft. in diameter and 140 ft. above ground.

Rustless to Build New West Coast Steel Plant

••• According to reports from the West Coast, Rustless Iron & Steel Corp., Baltimore, will establish a new electric steel producing plant.

Company officials stated that, while WPB had asked that the firm build an electric steel plant in the West to make use of Montana chromium concentrates and that plans had been submitted, the application has not yet been approved and details of the installation are not yet known. At least six locations for the plant have been under consideration, it was stated, but no choice of a plant site has been made.

Chicago Concern Seeking Pool of Machine Tools

Chicago

••• O. D. Jennings & Co., here, has offered to share profits with owners of idle machine tools who will pool their equipment to get war work. Turret lathes, engine lathes, milling machines and radial drill presses are needed to round out the equipment on hand. The company has offered to supply both capital and management to firms that will supplement Jennings' own equipment; or Jennings will purchase the equipment outright.

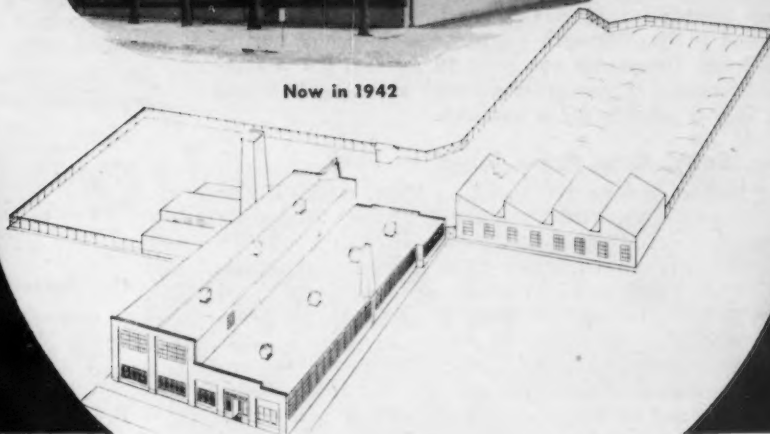
25 years of Service



Incorporated 1917



Now in 1942



REPRESENTATIVES

Boston . . . General Machinery Corp.
 Buffalo . . . R. C. Neal Co., Inc.
 Cambridge . . . Industrial Steels, Inc.
 (cutters)
 Canada . . . Geo. T. White Co.,
 Walkerville, Ont.
 Chicago . . . L. F. Carlton (cutters)
 Chicago . . . Weldon Engineering Co.
 Cleveland . . . S. G. Morris
 Cincinnati . . . Henry M. Wood Co.
 Detroit . . . R. B. McDonald (cutters)
 Detroit . . . A. C. Haberkorn Mach'y
 Hartford . . . George M. Pearse, Jr.
 London . . . Gaston E. Marbaix, Ltd.
 Los Angeles . . . Ralph W. Atkinson
 Milwaukee . . . J. M. Grimstad
 Newark . . . George M. Pearse
 Philadelphia . . . Walter A. Rankin
 (Drexel Hill)
 Pittsburgh . . . J. A. Bouslough
 Rochester, N. Y., R. C. Neal Co., Inc.
 San Francisco . . . Ralph W. Atkinson
 Syracuse, N. Y., R. C. Neal Co., Inc.

During this time, our customers' (your) business has made it possible for us to serve certain needs of industry.

Maintaining this service has meant that in every few years, additional facilities have had to be incorporated and in more than a few instances, this has called for added floor space. That these additions have been necessary has shown to us that we have a right to be proud of the manner in which we have tried to cooperate.

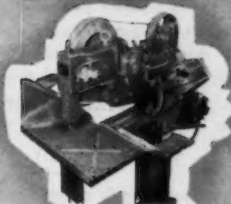
Invested in our products, the experience that is primarily a result of this service cannot but be of assistance to users of this equipment. Again, the solution of new problems are generally that much closer because of this experience.

We here at T-J want, now more than ever, to continue, and to extend, this service. Offices and Factory at 628 North Mechanic Street, Jackson, Michigan.

THE TOMKINS-JOHNSON CO.



RIVITORS



CLINCHORS



DIE SINKING
MILLING CUTTERS



AIR CYLINDERS
(ALSO VALVES)



HYDRAULIC
CYLINDERS

Fatigue Cracks

BY A. H. DIX

11-Penny Hole

• • • George Sullivan of the brains department tells us that the Philadelphia office of a certain steel company was asked the other day if it could supply a large quantity of 11-penny nails. "That's an odd size," the manager said. "Won't 10-penny nails do?"

The inquirer, a purchasing agent, hesitated and then asked, "Would the 10-penny size fit the holes in corrugated roofing?"

Ten For A Penny

• • • Incidentally, we learned from George that the penny method of specifying nail sizes originated in England in the fifteenth century. A 10-penny nail is 3 in. long. Originally you paid 10 pennies for a hundred of them. If you could do with a 2½-in. nail you paid only 8 pennies for a hundred.

Bang, Bang, Bang From Dawn to Dusk

• • • Nailers had no union and no 40-hr. week. Under hire to middlemen, called nail masters, they worked on piecework in small, filthy sheds attached to their dwellings. A work week of twice 40 hours was not uncommon. The job became synonymous with long, hard labor, and the saying "working like a nailer" persists to this day.

In the beginning one man did the whole job—hammered the nail to shape, pointed it and headed it. Then a Henry Ford of the times established a production line—one man roughing out the nails, another pointing, and another heading, from sun-up to sun-down. Production went up and prices down. So before long ten pennies would get you 200 ten-penny nails; thus they really became five-penny nails. But to avoid confusion the original size designation was retained. At the present time you get 9 ten-penny nails for a penny. We know this because in the interests of science we just bought a pound and counted them.

Stopper

• • • Daniel's Fiery Furnace Was Just a Smolder—*American Rolling Mill Co.*

He Confirmed Our Guess

• • • We knew vaguely that the pH of a solution is the degree of its acidity or alkalinity. But we wanted an exact definition, so we asked Frank Oliver, your favorite family journal's technical editor, about it. He looked it up in a book, and here it is, "the logarithm of the reciprocal of the gram ionic hydrogen equivalents per liter."

That's about what we thought.

They Said It First

• • • Best of the modern slogans is, in our opinion, "Don't Let Them Catch Us With Our Plants Down." We thought it was not more than a year or so old but learn from the *Houghton Line* that it is at least 3½. Its earliest known use was in the August, 1938, issue of the magazine *Cotton*, where it appeared in an advertisement of the Walker Electrical Co., of Atlanta, Ga.

This is a remarkable piece of prescience, as at that time the war seemed as remote to most of us as the planet Mars.

Gland Idea

• • • When we saw the headline, "Rejuvenating an Old Miller," in last week's issue we thought that some smart employer had installed a Voronoff unit as a means of countering the steadily rising average employees' age rate. But the item has to do only with Steinaching a senile milling machine.

Blurb

• • • Even if someone with a colder eye than ours examined the issues of your favorite family journal and its contemporaries for the last decade, he would find that our score in "breaking" major technical developments is something to marvel at. We are, we confess, first with the news most of the time.

Latest capital jewel in our editorial diadem is last week's 16-page report on electrolytic tinplate. Aside from a few sketchy news references, this is the first published account of the revolutionary new process. Our Lippert labored and brought forth a mountain.

The report is not only definitive, but in addition is covered with verbal sequins that cause it to glisten like the stainless steel spire on the Chrysler Building across the street. Samples:

"... necessity, the proverbial mother of invention, is on occasion a rather grim dame, somewhat bewildered by a whirlwind courtship, a shotgun marriage, and a Caesarean operation."

The harsh cathartic of necessity cut through the usual mental costiveness of Washington . . .

Our favorite is this:

Only a few months ago electrolytic tinplate's father spoke of him almost with apologetic reluctance, but today a variety of fathers, foster fathers, godfathers, and miscellaneous consorts coo and goo and march him proudly down the avenue.

Precisians will, of course, leave the *y* sound out of the final syllable, as a concession to poetic license.

Back to Hoover

• • • We had to go all the way back to Hoover to find a non-special issue with as much advertising as this one—180 pages. As the function of advertising in winning this war is obviously something on which we cannot speak without prejudice, we will let the Government have the floor. This is from a recent issue of *Domestic Commerce*, the Department of Commerce's weekly publication.

With the advent of war, advertising's function becomes increasingly important. One of its jobs is that of providing information to those fighting on the home front and in the production fields—information which will help producers in every possible way to increase the output of fighting tools. Such a program . . . includes information on better ways of using machinery, time-saving methods that can be adopted, labor-saving efforts made possible by new attachments or new operating tricks.

The other function of advertising, although wholly selfish, is nonetheless of vital importance to those businesses who wish their corporate hearts to continue two-stepping in proper diastolic and systolic measure. *Domestic Commerce* says:

Brand names can and should be kept alive in the minds of those to whom the manufacturer must look for business in the post-war period . . . History has shown that the buying public forgets quickly. Firms which temporarily neglect or abandon their advertising programs are seldom able to rebuild them . . .

Pardon us for talking shop.

Puzzles

• • • Last week's fish weighed 5 1/3 oz.

We are pretty well down to the bottom of the barrel as far as puzzles are concerned. All the good ones have been used up and it seems that people aren't taking time off to invent new ones. You can do this one in two minutes:

The product of three consecutive numbers is 6840. What are the numbers?



Northern Cranes handle all material in the storage yard of this steel mill.

Northern SUPER-CRANES SERVE A WIDE RANGE OF INDUSTRIES

Speed, fine control, excess capacity, exceptional durability, make these Northern Super-Cranes particularly valuable where service is heavy and continuous.

Northern quality assures continuous operation.



Handling plate storage in the warehouse of one of the largest steel fabricators.



A machine room crane in one of the large southern paper mills.



Northern Cranes handle all paper stored in this warehouse.

NORTHERN ENGINEERING WORKS
2607 Atwater Street Detroit, Michigan

Dear Editor:

SECOND-SAVING

Sir:

The editorial "Can You Save 30 Seconds A Day?" is so good that we would like to have 500 reprints to distribute to our employees, as soon as you can conveniently send them to us. We, of course, will be glad to pay for them.

It is again my pleasure to compliment you on your editorial policy and the character of your writing, which are of inestimable value to industry and should impress people in responsible positions everywhere, including Washington. The sound patriotic appeal of your editorials is important to all of us who are concerned and responsible for winning this war as quickly as possible.

GEO. V. BACH,
President

American Sterilizer Company,
Erie, Pa.

DURIBRONZE

Sir:

In your April 2 issue somebody inquired about Duribronze. In the April 23 issue, S. M. Brah thought that it was made by a company in Kokomo, Ind. The name of this company is American Art Alloys and the metallurgist, C. Molin, will surely inform you if they make Duribronze.

F. R. MORRAL,
Asst. Professor of Metallurgy
Pennsylvania State College,
State College, Pa.

Sir:

Perhaps Mr. Agricola had in mind Duronze which is used by several bolt and nut manufacturers in the fabrication of their product. If this is the case, I would advise him to refer his question to the Bridgeport Brass Co., Bridgeport, Conn., which is, I believe, the producer of this metal.

H. L. ELFNER,
Resident Engineer
International Harvester Co.,
Indianapolis, Ind.

CUTTING BRONZE RISERS

Sir:

Could you give us the name of any company manufacturing equipment suitable for cutting off gates and risers on manganese bronze castings, these gates and risers being as large as 3-in. dia. in some cases?

The shape of the casting is such that the machine has to be brought to the work instead of the work to the machine.

R. E. McARDLE,
McArdle Equipment Co.,
Houston, Texas

• We do not know of any manufacturer of equipment for this purpose. If the castings were steel or cast iron, obviously oxy-acetylene cutting torches could be used. But these will not work on bronze since the oxidation of

the metal does not take place fast enough to produce a clean cut. If the casting is strong enough to stand it, you might try nicking the riser with a cold chisel or hack saw, then fracturing it with a sledge hammer blow.—Ed.

TUBING AT \$2 A TON

Sir:

How much longer do you intend to carry in your market report for steel and wrought iron pipe and tubing at a base price of \$2 per net ton?

H. K. FORT,
Henry K. Fort Co.,
Philadelphia, Pa.

• Damn that decimal point. Of course, the price should be \$200.—Ed.

PLANE PRODUCTION PICTURES

Sir:

Could you arrange to send me copies of the articles published in THE IRON AGE, "New Miller Speed Plane Production," Jan. 15, 1942, and "Conveyor Line for Aircraft: Glenn L. Martin Co.," Nov. 6, 1941, to be used in this office in a collection of clippings pertaining to aircraft production?

D. G. VAN de WATER,
Bureau of Aeronautics,
Navy Department,
Washington, D. C.

MUNITIONS MANUFACTURE

Sir:

We have seen references to articles published in your magazine covering the manufacture of Ordnance Material such as shell, fuzes, gun carriages, etc.

If these articles have been issued in the form of reprints for general distribution, this production office is desirous of having copies.

LT. ANSON AVERELL,
War Department,
San Francisco, Cal.

• Iron Age articles on shell and cartridge manufacture have been reprinted in a 68-page book, price \$1.—Ed.

DEEP ETCHING

Sir:

Would you kindly send me one or two reprints of your article by George W. Walker on "Deep Etching" which was printed in your issue of April 2.

H. W. WHITNEY,
Metallurgical Engineer
Bliss & Laughlin, Inc.,
Harvey, Ill.

PLASTER MOLDS

Sir:

I would very much like to receive a reprint of an article which appeared in your Oct. 9, 1941, issue, entitled Plaster Molds, by W. A. Phair.

S. BASKIN,
Federated Metals Division,
American Smelting & Refining Co.,
New York City

TITANIFEROUS ORES

Sir:

Enclosed find 50c. Please send two copies of March 5 issue containing article, "Titaniferous Iron Ores Being Reworked." If you cannot supply copies, please send separate sheet of above article.

How much do you charge for reprints? Out here in Wyoming we have even a larger deposit of ore with higher TiO₂ content, and I might need a half dozen copies of article.

C. S. DIETZ,
Director

State School of Mines,
Cheyenne, Wyoming

• If we can supply clippings of articles from cut copies, the charge is nothing. Or if reprints have been made, one or a few copies are sent gratis in most cases.—Ed.

THREE-SHIFT SCHEDULES

Sir:

In one of your issues some months ago, you had a schedule according to which the working hours are distributed for the 168-hour week without too much over-time.

Would you please send me a copy of this schedule?

MARTIN THURNAUER,
Corona Corporation,
Jersey City, N. J.

• The article appeared in the Dec. 25, 1941, issue. Its title is "How to Operate Seven Days per Week." Clipping has been sent.—Ed.

CASTING DEFECTS CHART

Sir:

About a year ago you issued with THE IRON AGE a sheet called, "Cause of Gray Iron Casting Defects." This sheet was gotten out by W. B. McFerrin of the Cadillac Motor Car Division of General Motors.

As we are just opening a foundry of our own, we would appreciate having a copy of this.

E. VAMOS,
Jonson Foundry & Machine Co.,
New York City

GAGE BLOCK FACTORY

Sir:

In one of the recent publications coming to our desk there was an article entitled, "The Most Important Factory in the United States." It had to do with the manufacture of gage blocks.

We would like to find it, but cannot, as some of our issues are missing. Did it appear in THE IRON AGE?

JOSEPH PORZEL,
Empire Machine & Stamping Co.,
558 Parkside Ave., Buffalo

• Not in Iron Age. We recall seeing it in another publication, but don't remember which one. Can any reader help Mr. Porzel?—Ed.



AT MONARCH
we work
under these flags
for VICTORY

BEHIND NEW MEN AND OLD..

THE SPIRIT OF THE

Phantom Gear

THE FIRST LESSON taught to new men at Monarch emphasizes that we tolerate no letdown in quality, regardless of production pressure. This seldom needs repetition, because many of these newcomers are "old-timers" in machine shops, accustomed to accuracy and fine workmanship such as we insist on.

From foremen and fellow workers, our new men quickly gain the inspiration of "The Phantom Gear," that spirit of Monarch which for years has stimulated the building of better and more useful lathes. Now, "The Phantom Gear" has joined our country's services, and stands behind THE MONARCH MACHINE TOOL COMPANY . . . SIDNEY • OHIO

new men and old, encouraging them to give their utmost in the race to produce the implements of VICTORY.

★ ★ ★

You who use Monarch lathes to-day can depend upon these men not letting you down. They know the overwhelming importance of dependable tools to build planes and ships and tanks and guns. Old-timers and newcomers alike work with hands and heads and hearts so that the home forces will keep well equipped their sons and their grandsons who are on the firing line.

ACCURATE AS
ALWAYS

Even with vastly increased production, Monarch lathes continue to hold their reputation for unfailing accuracy.

Two reasons account for this. First, accuracy is a fundamental of Monarch design. Second, Monarch men are trained in quality production, and the maintaining of accuracy in their work is a standard, routine, everyday requirement.

MONARCH



LATHES

COVER THE TURNING FIELD

This Industrial Week . . .

• • •

FIVE months of war have reshaped the face of American industry in countless ways, relocating some of its plants, revising its manufacturing methods and converting its products from peace to war.

This week another in a series of drastic steps shut off the flow of metal to thousands of small plants making hundreds of metal products which are given no place in a war-time economy. From asparagus tongs to cake cutters; from metal roofing to Christmas tree ornaments—the list of products which may not be made of metal except for Army or Navy use is new evidence of the methods of total war.

By Aug. 3, no metal may be delivered, processed or assembled in

conjunction with 360 classifications of small metal products, according to the sweeping general conservation Order M-126. Before that date

For a complete list of banned metal products and explanation of General Conservation Order M-126, see pages 105-114.

the effect of the order will be felt in a series of blows. After May 20, no deliveries of metal may be made for manufacture of products on the prohibited list. During a 45-day transition period, only 75 per cent of metals processed in 1941, based on average monthly weight may be consumed. After 90 days from the governing date (May 5), no person shall assemble any banned item.

Conversion May Prove Difficult

Large industrial plants making automobiles and many other important civilian products have, of course, been under similar severe restrictions for months. Most large plants, however, have found it easier to convert to war production. The small plants affected by the

new conservation order in many cases will find conversion difficult, in some cases impossible. (Appeals from the provisions of this order must be made on Form PD-437 and must be filed with the field office of the WPB for the district in which the person appealing has his principal place of business.)

After months of discussion and temporary agreements on various plans which had to be dropped, machine tools have been placed under a limited allocation system with the issuance of Order E-1-B. Machine tools are to be apportioned out of each producer's monthly deliveries. Of these, 75 per cent are to go to the Navy Bureau of Ships, the Navy Bureau of Ordnance, Army Ordnance, air services and the Maritime Commission while the other 25 per cent will go to foreign and other purchasers. A confidential list specifies the percentage of

For full details of the new WPB order on machine tools, turn to page 170.

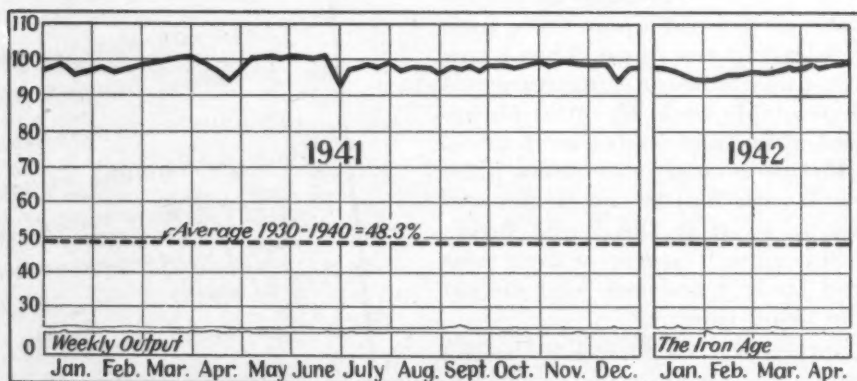
each type of tool to be delivered each month to different groups of service purchasers.

Maximum prices of all machines and parts not already covered by price schedules were set by OPA last Saturday at the Oct. 1 levels. Rentals and all sales except retail are covered by the order, Maximum Price Regulation 136, effective May 18. Included with new machines are rebuilt and used machines and parts, the price of which is fixed at 85 per cent of the Oct. 1 net price of the nearest equivalent new machine. All outstanding "freeze" letters and "informal agreements" covering machinery are superseded by the new regulation.

Throughout the five months of active participation in war, the need for ships has increased almost vertically, with production limited in part by the output of plates and of propulsion equipment. In April U. S. shipyards delivered 36 merchant vessels (launchings are higher), bringing the total of merchant ships placed in service during the first four months of

Steel Ingot Production—Per Cent of Capacity

(Open Hearth, Bessemer and Electric Ingots)



Steel Ingot Production, by Districts—Per Cent of Capacity

	Pitts-	Chi-	Youngs-	Phila-	Cleve-	Buf-	Wheel-	South	De-	S.Ohio	West	St.	East	Aggre
	burgh	cago	town	delphia	land	falo	ing	troit	troit	River	Louis	Louis	gate	
Previous Week . . .	100.0	105.0	101.0	92.0	99.0	106.5	83.0	95.0	105.0	104.0	97.0	107.0	98.5	100.0
This Week	100.0	105.5	101.0	92.0	95.0	106.5	83.0	96.0	101.5	101.0	97.0	105.5	99.0	99.0

1942 to 106. The 1942 ship quota is expected to be short by only two weeks and will be made up by January, 1943, while the 1943 quota of 15,000,000 tons is expected to be reached easily and surpassed in 1944.

To meet the demand for ship materials, many companies are making production records. Carnegie-Illinois Steel Corp., for example, is rolling plates at the rate of 3,600,000 tons yearly, nearly three times the 1940 production rate. An affiliated company on May 3 performed the extraordinary feat of launching four Naval destroyers at Kearny, N. J., in 50 minutes. Meanwhile several car building shops are already building ships or ship parts with more scheduled to get into this business. Pullman-Standard Car Mfg. Co. will build all-steel anti-Submarine patrol ships, the first vessels of the type to be made in the Great Lakes area. At various inland industrial centers, submarines, sub-chasers and other types of boats are being built in rapidly increasing numbers.

While the war program is be-

yond the new plant stage and is resulting in a heavy stream of war implements of all kinds from existing plants, reports of new plants continue to come out. U. S. Rubber Co. has announced that it will put into operation this year a large synthetic rubber plant in New England. Similar plants are planned for other sections of the country. An aluminum drop forge plant which will increase by millions of pounds monthly the output of aircraft forgings will be erected shortly by a General Motors subsidiary.

Work Week Is 70 Hours

With length of the work-week in U. S. munitions plants still a controversial subject, one American ship building plant reports that its employers are averaging 70 hr. a week. One aircraft plant and one ordnance plant are the only other war plants reporting employees averaging as much as 70 hr. a week. According to a Department of Labor survey, employees of only two of 70 aircraft plants reported were working below 40 hr. a week

in February while 28 aircraft plants reported their employees working 44 to 47.9 hr. a week, the favored range for this type of plant. Work weeks in these and other plants in many cases lengthened during March and April.

Each problem solved in the nation's vast war program frequently is replaced by another. Inevitably the war effort has ragged edges. This week one of the ragged edges was the award of a large contract for rifles to an Ohio company which is forced to buy more than a million dollars' worth of new equipment to fill the order. Another large plant in a nearby Ohio city has considerable idle machining capacity which might readily have been adapted to turning out rifles. Orders finally placed for stirrup pumps to be used by householders will require very large tonnages of steel tubing.

For another week the plans of the OPA for revisions in steel prices remain obscure to the manufacturers. OPA has asked several companies for cost data and reports persist that the extensive price structure of that industry is to be overhauled.

WORKING HOURS IN U.S. WAR PLANTS

(Distribution of plants according to plant average hours per week per man, February, 1942. Figures from the Department of Labor)

INDUSTRY	Number of Plants Reporting	Number of Plants with Average Hours Per Week Per Man of —																
		Less than 40.0	40.0 to 41.9	42.0 to 43.9	44.0 to 45.9	46.0 to 47.9	48.0 to 49.9	50.0 to 51.9	52.0 to 53.9	54.0 to 55.9	56.0 to 57.9	58.0 to 59.9	60.0 to 61.9	62.0 to 63.9	64.0 to 65.9	66.0 to 67.9	68.0 to 69.9	70.0 and Over
MUNITIONS INDUSTRIES:																		
Aircraft.....	70	2	3	4	14	14	6	7	7	1	7	2		1		1		1
Per cent of total.....	100.0	2.9	4.2	5.8	20.0	20.0	8.6	10.0	10.0	1.4	10.0	2.9		1.4		1.4		1.4
Cumulative percentage.....		100.0	87.1	92.9	87.1	87.1	47.1	38.5	28.5	18.5	17.1	7.1		4.2		2.8		1.4
Shipbuilding.....	55	2	3	8	5	11	8	4	2	2	2	2	4			1		1
Per cent of total.....	100.0	3.6	5.5	14.5	9.1	20.0	14.6	7.4	3.6	3.6	3.6	3.6	7.3			1.8		1.8
Cumulative percentage.....		100.0	86.4	90.0	76.4	67.3	47.3	32.7	25.3	21.7	18.1	14.5	10.9			3.6		1.8
Ammunition.....	60	9	4	5	6	16	7	1	5	3	1			2	1			
Per cent of total.....	100.0	15.0	6.7	8.3	10.0	26.7	11.6	1.7	8.3	5.6	1.7			3.3	1.7			
Cumulative percentage.....		100.0	85.0	78.3	70.0	60.0	33.3	21.7	20.0	11.7	6.7			5.0	1.7			
Guns.....	50	1	2	5	5	8	6	5	8	1	3	3	2			1		
Per cent of total.....	100.0	2.0	4.0	10.0	10.0	16.0	12.0	10.0	16.0	2.0	6.0	6.0	4.0			2.0		
Cumulative percentage.....		100.0	98.0	94.0	84.0	74.0	58.0	46.0	36.0	20.0	18.0	12.0	6.0		2.0			
Explosives.....	16	4	2	2	3	2	2				1							
Tanks and parts.....	11	2				2	2	1	3	1								
Instruments.....	16	1	1		1	1	2	1	1	4	2		1				1	
Other ordnance.....	99	6	14	12	12	10	11	9	4	6	6	3	2	1			2	1
Per cent of total.....	100.0	6.1	14.1	12.1	12.1	10.1	11.1	9.2	3.9	6.1	6.1	3.1	2.0	1.0			2.0	1.0
Cumulative percentage.....		100.0	93.9	79.8	67.7	58.6	45.5	34.4	25.2	21.3	15.2	9.1	6.0	4.0			3.0	1.0
TOTAL MUNITIONS INDUSTRIES	377	27	29	36	46	64	44	28	30	18	22	10	9	4	2	3	3	3
Per cent of total.....	100.0	7.2	7.7	9.5	12.2	17.0	11.7	7.4	7.9	4.8	5.8	2.7	2.4	1.0	.6	.5	.8	.8
Cumulative percentage.....		100.0	92.8	85.1	75.6	63.4	46.4	34.7	27.3	19.4	14.6	8.8	6.1	3.7	2.7	2.1	1.6	.8
OTHER WAR INDUSTRIES																		
Machine tools.....	214	3	3	2	3	10	20	21	16	33	30	25	18	8	7	5	1	9
Per cent of total.....	100.0	1.4	1.4	.9	1.4	4.7	9.4	9.8	7.5	15.4	14.0	11.7	8.4	3.7	3.3	2.3	.5	4.2
Cumulative percentage.....		100.0	98.6	97.2	96.3	94.9	90.2	80.8	71.0	63.5	48.1	34.1	22.4	14.0	10.3	7.0	4.7	4.2

BUY U. S. WAR SAVINGS
BONDS AND STAMPS



BUY ALL YOU CAN, AND
KEEP ON BUYING!



HANDS THAT KNOW THEIR STRENGTH

AMERICA today is a nation of fixed and indomitable purpose. It knows that, in this war, fighting forces across the oceans cannot triumph until the industrial armies at home—those in the service of supply—first win *their* victories. And America also knows its strength.

Allegheny Ludlum is a sinew of that strength. Our alloy steels wing aloft in planes. They cruise in ships and submarines. They serve in tanks, ordnance and field equipment, and tool the machines of production. They are essentials.



We have spent millions to increase the productive capacity of our mills. We have taken steps also to conserve strategic materials, vital to the nation in wartime. Recent products of Allegheny Ludlum research, steels which use less alloy without loss of performance, have been made available to anyone without restrictions.

These are the crucial months. Pledge all your energies, as we pledge ours, to America . . . with its sleeves rolled up to win this war in the only way it can be won—by *production, and the offensive!*

ALLEGHENY LUDLUM STEEL CORPORATION
PITTSBURGH, PENNSYLVANIA

★ Stainless and Heat-Resisting Steels ★ Tool Steels ★ Valve Steels ★ Nitriding Steels ★ Electrical Steels

News of Industry

....

WPB Forbids Use Of Metal in 360 Classifications

Washington

• • • The hand of government has reached out and turned the flow of all metals except gold and silver from commerce to war with the issuance this week by WPB of the long awaited and sweeping General Conservation Order M-126. By Aug. 3, no metal may be delivered processed or assembled in connection with any of the innumerable articles included in list A of the order. This list comprises 360 classifications.

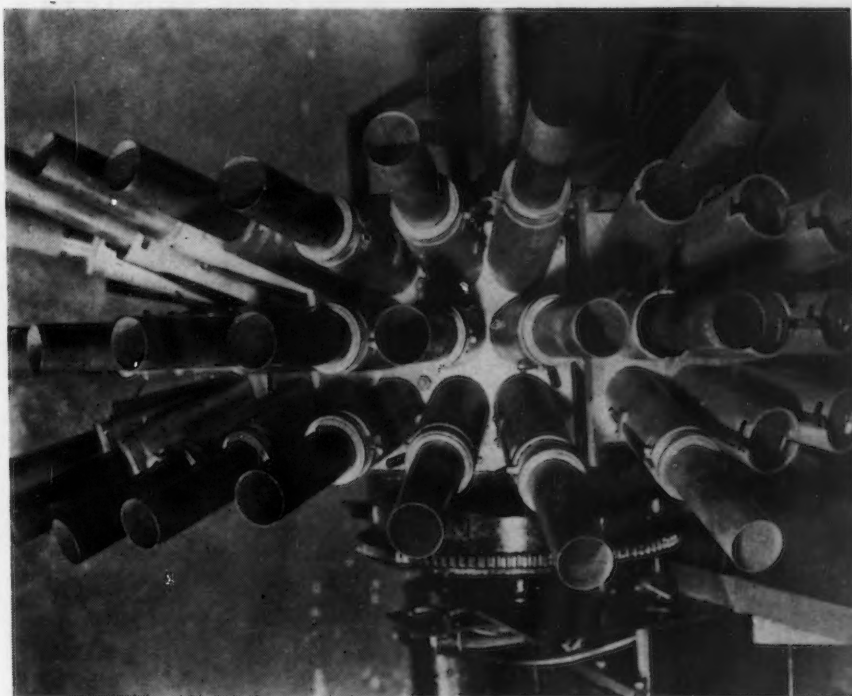
There is much feeling that the order is more than an enforced temporary anesthetic or twilight sleep from which metal working industries will be awakened after

The priorities roundup begins on page 156. The week's price developments begin on page 144.

the war to return to civilian business. Fear is felt that it is the stroke of death for many small companies unadaptable to war conversion.

Other products not on list A of the order may not be made of iron or steel, unless the use of substitute materials is impractical. No other metals may be processed. If steel is used, it must not be alloy steel when carbon steel can be used, and minimum amounts must be employed. Army and Navy and the Maritime Commission are exempt from this provision.

Practically every industry, business and individual is hit by the order. Metal products taken from civilians range from ash sieves to work benches. Householders will find that asparagus tongs, bath tubs, beds, cake cutters and



AP Photo

STRIFING GUN: Looks complicated, but it is claimed even a novice gunner can be quickly trained to operate this multi-barrelled aerial ground strafing gun. Electrically operated and fired, a single push of a button will fire 15 shots, and a full charge is 90 shells. Flares, solid shot, gas shells, or shrapnel may be used, and if flares are mixed with solid shot, the gunner lights his own target.

Christmas tree ornaments are only a few of the things which will disappear from the stores for the duration.

Nothing is too small to fall within the metal ban. Incense cans, fountain pens, compacts and B-B shot are examples of the wide diversity of products to be shoved off the market.

Iron and steel metal roofing and siding may not be made except for the following purposes: For delivery on a preference rating of A-1-k or higher assigned by an Army or Navy preference rating certificate or by a preference rating order for construction in the P-19 series; for defense housing, as permitted by the Defense Housing Critical List; or, for the manufacture of railroad freight cars, street cars, buses, trucks or trailers.

For delivery to or for the account of the Army or Navy, the Maritime commission, the Panama Canal, the Coast and Geodetic Survey, the Coast Guard, the Civil Aeronautics Authority, the National Advisory Committee for Aeronautics, and the Office of Scientific Research and Development.

Or, for delivery to an ultimate

purchaser for maintenance and repair purposes regardless of rating. (Production during 1942 is limited to 20 per cent of these products made by him during 1940, and in 1943 and subsequent years, to 25 per cent of his 1940 production.)

Inventories of iron and steel products held by manufacturers after production and assembly have been stopped may be sold to the Metals Reserve Co., RFC subsidiary, and also with the specific authorization of the WPB Director of Industry Operations. Inventories may likewise be sold to a person engaged in the manufacture of similar items for fabrication or assembly, but subject to the order's limitations. An A-1-k rating is sufficient to move alloy steel, and all other iron and steel may be sold on purchase orders of A-10 or higher.

The terms "iron" and "steel" are defined to exclude screws, nails, rivets, bolts, wire, strapping, and small hardware for joining or other similar essential purposes.

Appeals should be made only by or through manufacturers, and should be filed with the WPB field office for the district in which the

person appealing has his principal place of business.

The order takes precedence over every contract or commitment made subsequent to the date of its issuance, and governs in all cases except where there is another order whose terms are more stringent.

The provisions with respect to deliveries restrict them not only to

other persons, including affiliates or subsidiaries, but also from one branch, division, or section of a single enterprise to another branch, division, or section of the same or any other enterprise under common ownership or control.

WPB officials say that the order is only an instrument of confirmation. In other words, the manufacturers affected cannot get pri-

orities to continue operation. The effect of the order, therefore, it is pointed out, is to shut off needless paper work in applying for preference ratings on the part of industry, and the issuance of denials by WPB.

Deliveries of Metals for Banned List End May 20

Almost 400 classifications of products from ash sieves to work benches cannot be manufactured from any metal after June 19. These classifications cover innumerable items.

During a 45-day transition period, only 75 per cent of metals processed in 1941, based on average monthly weight, may be consumed.

No deliveries of metals to be made into articles on the prohibited list may be made after 15 days from the governing date of May 5, 1942.

After 90 days from the governing date no person shall assemble any banned item.

No person shall deliver or accept delivery of any article which was fabricated, assembled or delivered in violation of the order's provisions.

A number of the products in the prohibited list are temporarily exempted from the production ban in behalf of the Army and Navy, and some are permanently exempted.

The complete list of articles which may not be made of metal after June 19 follows:

A

Access panels, except as required by Underwriters Code

Accoustical ceilings
Advertising novelties

Air - conditioning systems, except for hospital operating rooms and industrial plants*
Amusement park devices and roller coasters*

Area walls
Ash sieves
Asparagus tongs
Atomizers, perfume, boudoir
Attic fans
Autographic registers*
Automobile accessories, except as required by law

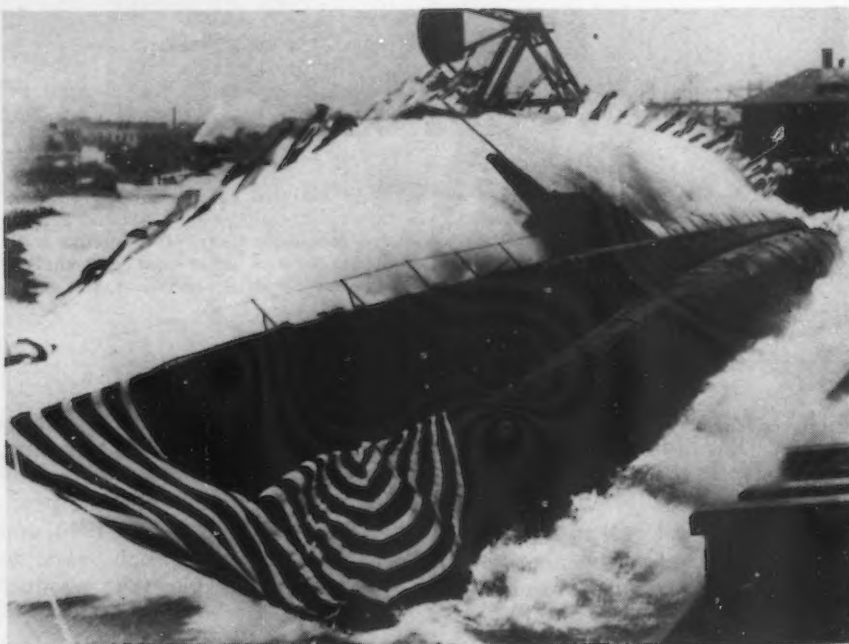
Automotive replacement parts, non-functional
Awning frames and supports

B

Bag, purse and pocketbook frames
Barber and beauty shop furniture
Baskets, except for commercial cooking and manufacturing uses
Bath tubs
B-B shot for air rifles
Beds, except hospital
Bed spring frames, except for hospital link fabric spring type bed
Beer kegs, except hoop and fittings

FRESH WATER LAUNCHING: Far from the ocean at a Wisconsin shipyard on the Great Lakes, this undersea fighter, the U. S. Peto, was launched. It is believed that this is the first time a U. S. submarine has been launched sideways.

INS Photo



SEAMSTRESSES FOR WAR: At Briggs, where more than 70 different shapes and parts for American Flying Fortresses are built, large numbers of women are employed. These women are sewing fabric on ailerons for fighter planes.



for wooden kegs
Beer mugs
Beer stands
Beer stains
Bench legs, except industrial
Binoculars, except U. S. Government Agencies
Bird cages and stands
Bird houses and feeders
Biscuit boxes
Blackboards
Blade stropers, mechanical
Bleachers and grandstands*
Book ends
Bottle holders
Boxes and trays for jewelry, cutlery, combs, toilet sets, etc.
Bread racks
Bridge splash guards
Building ornaments
Butter chips
Butter knives

C

Cabinets, except:
(a) Hospital operating and examining rooms.

*Maintenance and repair excepted.

(b) Office furniture as permitted in Limitation Orders L-17-a and L-62
Cake cutters
Cake tongs
Candy display dishes
Canopies for electric brooders
Canopies and supports
Cans or containers for:
Anti-freeze, under 5-gal. size
Artist supplies
Bouillon cubes
Candy
Caviar
Chalk
Coffee
Gloves
Incense
Lawn seed
Nuts
Pencils
Pet food
Phonograph needles
Playing cards
Razor blades
Sponges
Staples
Tennis balls
Tobacco products

Toilet water
Yarn
Carpet rods
Carving set holders
Cash boxes
Cash registers*
Casket hardware
Cattle stanchions, except hangers and fasteners
Ceilings
Cheese dishes
Chicken crates
Chick feeders
Christmas tree holders
Christmas tree ornaments
Cigar and cigarette holders and cases
Cigarette lighters
Cigar clippers
Clock cases, except on recording and controlling industrial instruments
Clothes line pulleys
Clothes racks and dryers
Clothes trees
Coal chute and door, household
Coal pans
Cocktail glasses
Cocktail sets
Cocktail shakers
Coffee roasting machinery
Compacts
Cooking stoves, commercial electric*
Copy holders
Corn cribs
Corn poppers and machines
Counter tops
Croquet sets
Crumb trays
Cupboard turns
Cups of all kinds, drinking
Curb guards

D

Decorative iron products
Dictaphone racks
Dinner bells
Dishwashing machines, except hospitals*
Dispensers, hand, for:
Hand lotions
Paper products
Soap
Straws
Document stands
Door chimes
Door knockers
Door closers, except:
(a) Fire prevention as required by Underwriters' code
Door handles, except shipboard use
Door stops

Drain boards and tub covers, household
Drawer pulls
Dress forms
Dummy police
Dust collecting systems and equipment, except on A-1-j or higher*

E

Ediphone racks
Egg slicers
Electric water coolers, except on

PD-1a or PD-3a certificates
Enamel store fronts
Erasing knives
Escalators*

F

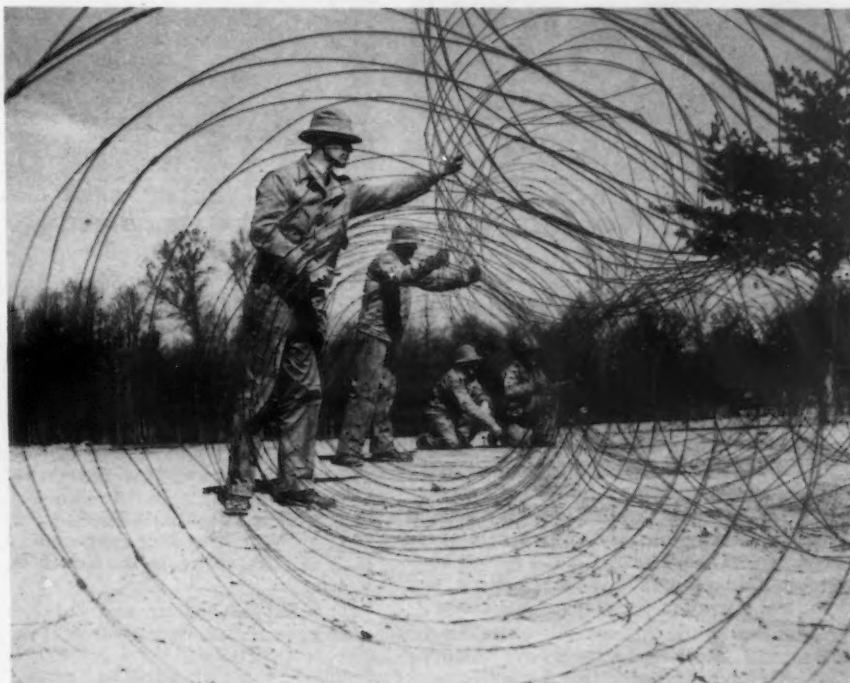
Feed troughs
Fence posts, except on A-2 or higher
Fences, chain link, except on A-2 or higher
Fences, ornamental
Finger bowls

Fireplace equipment, except dampers
Fireplace screens
Fish aquariums
Flagpoles
Flashlight tubes
Floor and ceiling plates for piping
Floor and counter covering trim
Floor polishing machines
Flour, salt and pepper shakers
Flower boxes, pot

holders, and vases
Flower shears
Fly traps
Foot baths, except hospitals
Foot scrapers
Fountain pens, except functional parts
Fountains, ornamental
Furniture*, except:
(a) Wood furniture
(b) As listed by Limitation Or-

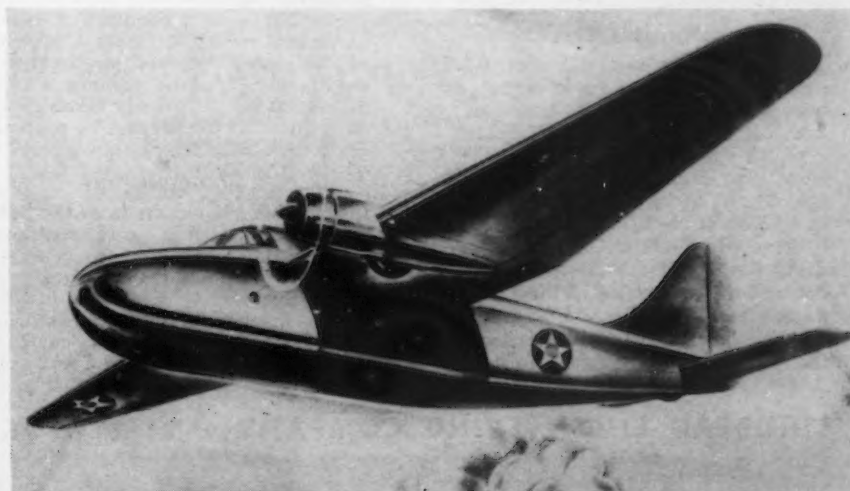
TRUCK STOPPERS: Army engineers are laying this tempered steel wire to stop trucks and other light vehicles, the wire catching in the wheels.

Acme Photo



NO CRITICAL MATERIALS: This is the new cargo transport which Curtiss-Wright Corp. announced it would build of wood and other "non-strategic materials" in a new plant "somewhere in Kentucky." This new Curtiss C-76 will be about the size of the transports used by domestic airlines.

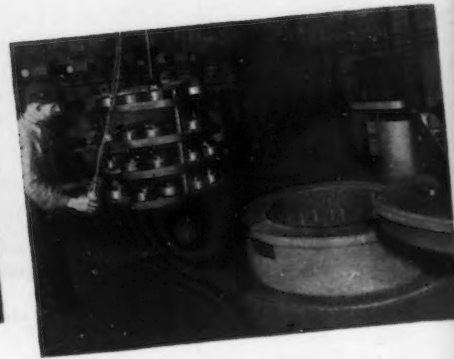
AP Photo



NEW HEATING PRINCIPLE BLASTS TRADITION!

SUPER-CYCLONE FURNACE

INCREASES PRODUCTION • KEEPS WORK STRAIGHTER • REDUCES HANDLING



ALL THE ADVANTAGES

of 100% forced convection heating are now available in the annealing, normalizing, and hardening ranges. For years, textbook theories and tradition said that heat could not be successfully transmitted by 100% forced convection heating at temperatures above 1300° F. Lindberg Engineers, with the experience of designing several thousand Cyclone Tempering Furnaces, could see no logical reason for the heat limitation at that point. Twenty-one months ago they built a furnace to disprove it—the first Super-Cyclone. It was a success from the start . . . temperatures to 1750° F. with 100% forced convection heating, and equal heating and control accuracy throughout the range.

In blasting the "it-can't-be-done" tradition, the Lindberg Engineers are now able to offer you a furnace that increases production, keeps work straighter, and reduces handling. In addition, the Super-Cyclone generally requires but 1/3rd the floor space occupied by conventional equipment to handle the same or greatly increased production.

REPLACES 8 FURNACES

Typical of this is the Super-Cyclone shown above. A large midwestern appliance manufacturer was annealing grey iron castings in 8 radiation heated box type furnaces occupying an area 36' x 9'. Now, one Super-Cyclone, requiring an area 6' x 9', turns out twice as much work in 8 hours as all 8 furnaces had previously done in 16 hours! One Super-Cyclone using but 1/6th the floor area, actually doubled the production of the 8 older furnaces. One Super-Cyclone's production is 12 times greater per unit of floor space than that of the 8 box type furnaces!

SUPER-CYCLONE

KEEPS WORK STRAIGHTER—reduces handling 83%!

The worm gears shown on the fixture, in the above photograph, are SAE 4140, weigh 20 lbs. each and have a maximum section of 3". They are heat treated to 45 R.C. A load of 100 worms (2000 lbs.) is placed on the fixture, heated in a 38" diameter x 60" deep Super-Cyclone and quenched on the same fixture. The previous method was to heat in a radiation type box furnace with a hearth 36" wide x 5' deep, holding a maximum of 30 worms at one time. It took 3½ hours to heat the 30 worms in the box furnace. Time to heat the 100 worms in the Super-Cyclone is 4 hours.

The Super-Cyclone and the box furnace require the same floor area, 8' x 11'. The box furnace turned out 8 gears per hour. The Super-Cyclone turns out 25 gears per hour . . . a production increase of 300%.

STRAIGHTNESS

In hardening the worms from the box furnace, 85% went out between .015" and .025". The high hardness of 45 R.C. made straightening extremely touchy. Straightening 100 worms required 8 hours. In hardening from the Super-Cyclone, 90% of the gears required no straightening whatsoever, and the balance was out a maximum of .010", easily taken care of in 30 minutes on the press . . . a reduction of 7½ hours straightening time per 100 gears.

HANDLING TIME

In handling 100 worms from the box furnace, 3 man-hours were required for loading, unloading, and quenching individually. In handling 100 worms from the Super-Cyclone, ½ man-hour is required for loading the fixture, quenching, and unloading. Handling time is cut to 1/6th of what it previously had been!

SUPER-CYCLONE

INCREASES PRODUCTION 670%—keeps rings round!

Above you see another example of the Super-Cyclone's ability to increase production, reduce handling, and minimize distortion with 100% forced convection heating. The illustration shows a load of 63, SAE 52100 bearing races on a fixture, being charged into a Super-Cyclone. When heated through, the rings will be quenched, fixture and all. When tested, they will be 62-65 R.C. and will be within .006" to .010" of round, the accepted range.

The previous method was to heat in a radiation type box furnace and quench individually on a special jig. This was done to hold the rings to .006" to .010" of round, which is now done in the Super-Cyclone . . . 63 at one time without jigs.

PRODUCTION INCREASED

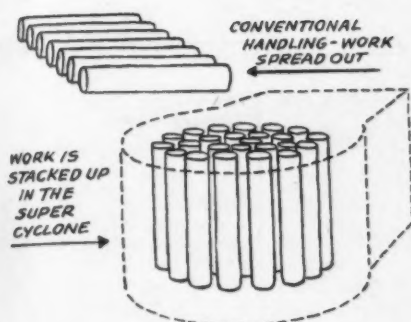
But let's compare the two methods of handling on an 8 hour day basis to give a clearer picture of the Super-Cyclone's ability in helping you to solve your heat treating problems. The box furnace turned out 64 rings per day. The Super-Cyclone turns out 432 rings per day, a production increase nearly 7 times greater than the box furnace. It would take 7 box furnaces and 7 men to approximate the production of the one Super-Cyclone!

HANDLING TIME REDUCED

The box furnace demanded the constant attention of one man, but the Super-Cyclone requires the services of a heat treater for only 1½ hours of the day, leaving 6½ hours in which he is free to do other work. In this one plant, Super-Cyclone production is nearly 7 times greater than the box furnace production and handling time is reduced 81%.

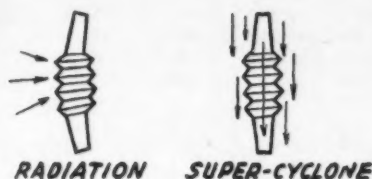
LINDBERG ENGINEERING COMPANY • 2452 WEST HUBBARD STREET • CHICAGO

LINDBERG FURNACES



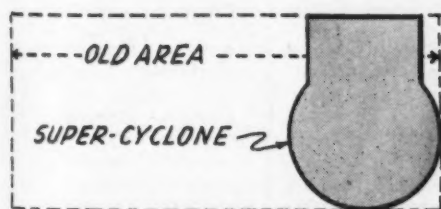
INCREASES PRODUCTION

You can roughly check the production increases possible in your shop through the Super-Cyclone by spreading an average load of parts on the floor, one layer thick, as laid out in a radiation heated furnace. Now, take another load of those same parts and stack them up in a 36" diameter circle, 4' high, making allowance for spacers and supports. Figure it will take a maximum of 3 hours to heat the load and 5 minutes to quench. Ordinarily you will find production increases of 200% to 1000% possible.



KEEPS WORK STRAIGHTER

The 100% forced convection heating principle of the Super-Cyclone means that the work is heated uniformly and accurately by air, driven at high velocity through the charge. The heat source is confined to a separate chamber, away from the work, to prevent radiant heat, of a source hotter than the desired work temperature, from striking the charge and causing distortion. Thus straightening time is eliminated or reduced to a fraction of what is required from conventional equipment and the man-hours previously required for straightening are now available for other work.



LESS FLOOR SPACE

As a conservative thumb rule, you can figure that the Super-Cyclone will require not more than 1/3rd the floor space required by any other equipment to handle the same or greatly increased production. This rule is general, of course, and may not fit all cases. It is based on averages of what the Super-Cyclone has done in other plants. A Lindberg Representative can give you, quickly and accurately, any production figures, floor space layouts, or other information you may need.

STANDARD SIZES IN WHICH THE SUPER-CYCLONE IS AVAILABLE

Delivery time is speeded considerably when standard size furnaces are selected, rather than special sizes which must be drawn up. Drawings are available for the following sizes of Super-Cyclones all of which have been built and are in operation. Most are gas fired, although a number are available electrically heated.

CHAMBER SIZE

16" diameter x 20" deep
22" diameter x 26" deep
22" diameter x 36" deep
25" diameter x 20" deep
25" diameter x 30" deep
25" diameter x 48" deep
28" diameter x 28" deep
28" diameter x 48" deep
28" diameter x 60" deep
33" diameter x 36" deep
33" diameter x 48" deep
38" diameter x 36" deep
38" diameter x 28" deep
38" diameter x 60" deep
43" diameter x 48" deep
48" diameter x 72" deep
60" diameter x 36" deep
60" diameter x 48" deep
60" diameter x 72" deep

SUPER-CYCLONE QUENCHING

When the first Super-Cyclone was being designed, Lindberg Engineers anticipated the obvious problem of mass quenching of heavy loads and devised equipment to take care of the situation. A typical example is the 2000 lb. load of worm gears shown on the opposite page, which is heated and quenched, fixture and all. Jobs similar to this are being quenched, with perfect results, every day in plants all over the country.

Heat treaters who have seen the Super-Cyclone in action, quickly appreciate that to secure all the advantages of which the furnace is capable, the quench must be looked at from an entirely new standpoint. This involves quench tank size, oil velocity, volume of oil, cooling and storage.

Twenty-one months of production experience in our own plant and in the field, with over 100 installations, have enabled Lindberg Engineers to work out an accurate formula which greatly simplifies this problem.

SUPER-CYCLONE HAS WIDE RANGE OF USES

THE TEMPERATURE RANGE of the Super-Cyclone is 250° F. to 1750° F. with equal heating and control accuracy throughout the entire range. Thus it is a highly flexible unit for the small or medium heat treating department, as well as a heavy production unit for the large shop when put to work on one type of job.

Among the operations being handled by over 100 Super-Cyclones already in service are the following:

HARDENING: Typical of the Super-Cyclone's ability to turn out heavy production of touchy parts are the examples shown on the opposite page.

ANNEALING: A large Wisconsin foundry is annealing and normalizing loads averaging 5,000 lbs. One Super-Cyclone 60" diameter x 48" deep turns out 17½ tons of work per day.

NORMALIZING: Because work can be stacked up densely, and quickly heat-

ed, The Super-Cyclone is an ideal furnace for normalizing.

TEMPERING: The Cyclone Principle of heating is well known to heat treaters for extremely accurate tempering under heavy production conditions. You can temper in the same furnace that you harden in with perfect heating accuracy for both operations.

NITRIDING: The Super-Cyclone fitted with a retort and cover does the same uniform job of nitriding as the standard Cyclone Nitriding Furnace. In addition, the temperature range of the Super-Cyclone enables the retort to be "cured" without removing from the furnace.

SPECIAL HEATING: Because work can be preheated at any desired rate—and cooled according to a definite schedule, the Super-Cyclone is well suited to stress relieving, spheroidizing, malleablizing and other heating operations requiring a specific cycle.

OVER 100 SUPER-CYCLONES ALREADY IN SERVICE

IMPORTANT NOTE: Like all other Lindberg developments, the Super-Cyclone has been thoroughly proved under 24-hour a day production conditions for a minimum of 12-months before announcement to the trade. Every effort has been made to restrict the sale of these units until the probationary period was completed. In spite of this, however, many of those who have seen the furnace in operation during the past 18-months have quickly been aware of its production possibilities and requested that units be constructed for them. Thus, over 100 Super-Cyclone installations are in service from coast to coast. One or more of these is near you, as is a Lindberg District Office, staffed by practical and competent sales engineers. The Super-Cyclone is *not* a cure all, nor do we represent it as such. It is speeding production, turning out straighter work, and cutting costs for many firms however, and we will be glad to survey its possibilities for you, on your work, at your request.

SUPER-CYCLONE FOR ANNEALING, NORMALIZING, HARDENING, AND TEMPERING

HYDRIZING FOR SCALE-FREE AND DECARB-FREE HARDENING

CYCLONE FOR LOW COST ACCURATE TEMPERING



LOW-COST PROTECTION with Careyclad BLACK METAL COATING

If your normal supply of metal coatings has been restricted, CAREYCLAD may meet your requirements. CAREYCLAD does an effective job; it's economical; and the supply is plentiful.

CAREYCLAD protects metal against rust and weather—is extremely durable, abrasion resistant, and resistant to acid, alkaline and salt atmospheric conditions. It is a practical, low-cost coating for metal buildings, iron sheets, structural steel, bridges, heavy machinery, ornamental iron work, and numerous sheet metal products.

Applied by spray painting, brushing, or dipping, at everyday indoor or outdoor temperatures. Promptly available in quantity through CAREY Branches and distributors everywhere. Write for details, address Dept. 26.

INDUSTRIAL BUILDING PRODUCTS OF ASPHALT—ASBESTOS—MAGNESIA

Roofing . . . Siding . . . Flooring . . . Insulations . . . Roof Coatings and Cements . . . Waterproofing Materials . . . Expansion Joint . . . Asbestos Paper and Millboard

THE PHILIP CAREY MANUFACTURING COMPANY • Lockland, Cincinnati, Ohio

IN CANADA: THE PHILIP CAREY COMPANY, LTD. Office and Factory: LENNOXVILLE, P. Q.

ders L-13-a and L-62

(c) Hospital operating and examining rooms
(d) Hospital beds and cots.

Jewelry
Jewelry cases

K

Kitchenware of stainless steel
Knitting needles

L

Garage hoists, car lifts and racks
Golf bag supports
Grain storage bins, except strapping, hardware, and reinforcing materials
Grass shears
Grilles
Ornamental Sewers*, except on A-2 or higher and reinforcing for concrete sewers
Gutters, spouting, conductor pipe, and fittings for single family dwellings

Lard or vegetable oil tubs, except 5 lbs. and over and straps for wood containers
Laundry chutes
Laundry trays, except reinforcing mesh
Lavatories, except hangers
Lawn sprinklers
Letter chutes
Letter openers
Letter trays
Lighting poles and standards*
Lipstick holders
Lobster forks
Lobster tongs
Lockers, except:

(a) Oil refinery use

(c) Office equipment as listed by Limitation Order L-13-a

Looseleaf binding wire, rings, posts and metal parts

M

Hair curlers* non-electric
Hair dryers
Hand mirrors
Hangers and track for garage doors for private use
Hanger rings on brushes, brooms, etc.
Hat frames
Hat-making machinery*
Hedge shears
Helmets, except on A-2 or higher
Hose reels, except:
(a) Fire fighting equipment
(b) Industrial uses in direct fire hazard areas
House numerals

Mall boxes, except as required by U. S. postal regulations

Mailing tubes
Manicure implements

Marine hardware for pleasure boats

Marquees

Match boxes

Material for housing, not otherwise specified in this order, except as allowed in Defense Housing Critical List

Mechanical book binding wire

Measuring pumps and dispensers* for gasoline station, garage and household use, including but not limited to:

Gasoline dispensing pumps
Grease pumps
Oil pumps, except barrel pumps and lubesters

Kerosene pumps
Air pumps

Menu holders

Milk bottle cases

Millinery wire and gimps

Mop wringers

Music stands

J

Jam boxes
Jelly molds

N

Napkin rings
Necktie racks
Newspaper boxes or holders
Novelties and souvenirs of all kinds
Office machinery used for:
Change making
Coin handling
Check cancelling
Check cutting
Check dating
Check numbering
Check signing
Check sorting
Check writing
Envelope handling
Envelope opening
Envelope sealing
Envelope stamping
Envelope mailing
Folding contents of envelope

O

Ornamental hardware and mouldings
Outdoor fireplace parts

P

Packing twine holders
Pail clasps
Paint spray outfits, except industrial
Paper rollers, household
Park and recreational benches
Parking meters
Pencils, automatic
Pencils, non-automatic
Pen holders
Permanent wave machines
Pet beds
Pet cages
Pet dishes
Phonograph motors, hand wound
Phonograph record blanks
Photograph accessories
Physical reducing machines
Picture and mirror hardware
Pie plates, except commercial or institutional
Pipe cases
Pipe-cleaner knives
Plant and flower supports and containers
Pleasure boats
Pneumatic tube delivery systems*, except industrial
Polishing-wax applicators

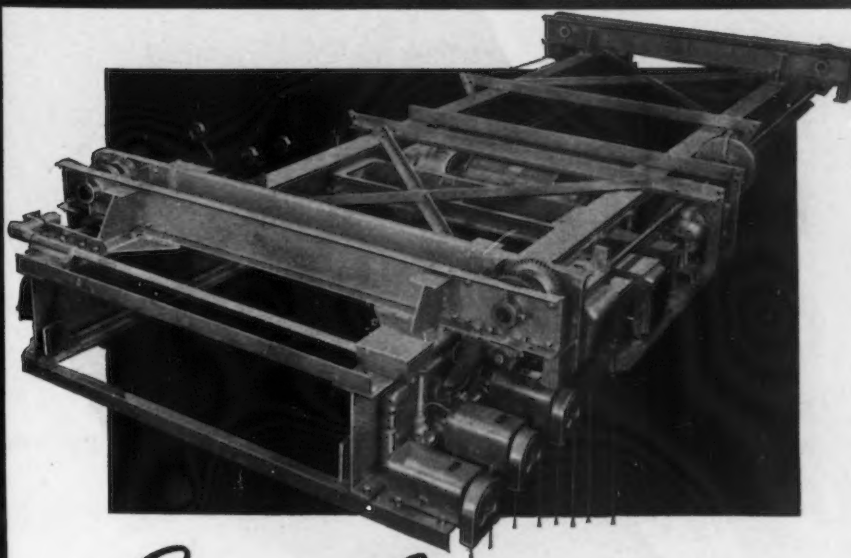
Polishing-wax sprayers
Portable bath tubs
Posts for fencing, except on A-2 or higher
Poultry incubator cabinets
Push carts
Push plates and kick plates, doors

R

Racquets
Radiator enclosures
Radio antennae poles, except on ratings of A-2 or higher*
Refrigerator containers and trays, household
Rotary door bells

S

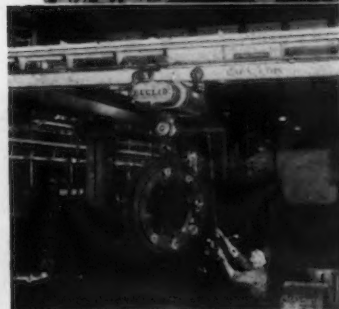
Salesmen's display cases and sales kits
Salt and pepper holders
Sample boxes
Scaffolding
Screen frames, except industrial processing
Scrubbing boards
Service food trays
Sewer pipe, exterior installations*, except for vents and within 5 ft. of buildings
Sheet iron or hoop iron packings for cookies and sweet goods
Shirt and stocking dryers
Shoe cleaning kits
Shower receptors, except frames
Shower stalls, except frames
Show window lighting and display equipment
Sign hanger frames
Sign posts
Signets
Silos, except strapping and reinforcing*
Sink aprons and legs
Sink metal drainboards, both integral and removable
Sitz baths
Skates, roller and ice
Ski racks
Slide fasteners
Snow shovels and pushers, hand and power propelled*, except A-1-j or higher
Spittoons
Sporting and athletic goods



Special EUCLID CRANE *Applications* using STANDARD UNITS

IN addition to an extensive standard line, Euclid also builds cranes to operate efficiently under special or unusual conditions.

As a rule, these cranes are special only in the structural design of bridges and trolleys, the hoisting and traveling mechanisms, brakes, controls, etc., being of Standard Euclid design.



This use of standardized, interchangeable working parts wherever possible, even in special cranes, makes it possible for us to furnish customers replacements more quickly and at less expense.

Illustrated above is an interesting example of a special underslung crane designed for use under limited headroom conditions. It has a submerged trolley which runs on rails welded to the lower inside flanges of I-beam girders.

Every executive charged with the responsibility of moving materials should have Euclid Catalogs describing both cranes and hoists. Write for them.

THE EUCLID CRANE & HOIST CO.
EUCLID, OHIO, Suburb of Cleveland



Put in a phone call for Bryant

"Operator, give me long distance — Springfield, Vermont, FIVE - SIX - O:
Bryant Chucking Grinder Company — station to station."

When bothersome questions crop up on internal grinding jobs, time and money can often be saved if you put in a phone call for Bryant.

Whether the answer can be given at once in so many words, or whether Bryant can help you more by dispatching bulletins, memos, blueprints or even a service crew to the scene of action, you can count on a prompt response when you put in a phone call for Bryant.



Bryant's productive capacity, already tripled, is constantly increasing. No other organization in America of comparable size and experience is devoted exclusively to designing and building machinery for internal grinding work.

Not only should Bryant engineers be able to help you speed defense, but they welcome opportunities to begin work, *at the earliest possible stage* on new products for post-war markets.

If you believe in planning ahead, put in a phone call for Bryant.

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

Spray containers, household
Stadiums*
Stamped bakery equipment
Stamps and tablets
Starter shingle strips
Statues
Steel wool for household use made from other than waste
Store display equipment and show cases

Structural steel home construction
Subway turnstiles*
Sugar cube dryer trays
Sugar holders
Swivel chairs

T

Table name - card holders
Table tops for household use
Tags

Identification Key
Name
Price
Tanks (strapping excluded)
Dipping, for animals
Watering, for animals
Feeding, for animals
Storage, beer
Storage, water, except:
(a) In tropical climates

(b) Heights in excess of 100 ft.
(c) Boilers, hot water storage
(d) Pneumatic pressure tanks under 31 gallons
Teapots
Telephone bell boxes, except bases and where required for safety
Telephone booths
Telescopes, except

U. S. Government Agencies
Terrazzo spacers and decorative strips, except hospital operating rooms
Thermos jugs and bottles over 1 qt.
Thermometer bases, household
Tile, steel-back
Tongs, food-handling and household use
Tool boxes, except industrial
Tool cases, except industrial
Tool handles, except power driven

U

Urinals

V

Voting machines

W

Wagon bodies, frames and wheels, all metal*, except for construction

Wardrobe trunks
Wastebaskets
Water color paint boxes
Weather stripping
Wheelbarrows, except wheels
Whiskey service sets
Window display advertising
Window stools
Window ventilators, except industrial and hospital
Wine coolers
Wine service sets
Wire parcel handles and holders
Wire racks and baskets, except
(a) Industrial
(b) Scientific laboratory equipment
(c) Animal cages for biological work
Work benches, except shipboard and industrial where required for safety
*Maintenance and repair excepted.

What do you demand
in a crane or hoist!



Two 20-Ton Shepard Niles Riveted Girder Cranes together with a battery of Liftabout Hoists, speed assembly for this Machine Tool Manufacturer.

What Do You Demand in a Crane or Hoist?

● **STRENGTH?** Ruggedness in design that provides a generous margin of safety.

It's inherent in a Shepard Niles.

● **POSITIVE CONTROL?** Every slightest movement of bridge and trolley under complete control of the operator.

It's synonymous with a Shepard Niles.

● **EXCESS CAPACITY?** Ability to lift a reasonable overload, occasionally, without injury to its operating mechanism.

It's built into a Shepard Niles.

● **ENCLOSED DESIGN?** Enclosures that shut out dust, dirt and moisture from all electrical and mechanical parts.

It's assured in a Shepard Niles.

SHEPARD NILES
A COMPLETE LINE OF CRANES & HOISTS
356 SCHUYLER AVENUE • MONTAUR FALLS, N. Y.



New Contracts Awarded
By War Department

••• The War Department, announced April 28:

1. Award of a contract to Black & Veatch of Kansas City, Mo., and Platt Rogers, Inc., Pueblo, Colo., for architect-engineering construction and management services for a cantonment at Pando, Colo. Construction will cost in excess of \$3,000,000 and will be supervised by the Salt Lake City District Office of the Corps of Engineers.

2. Award of a contract to E. C. Atkins & Co., Indianapolis, for consultant services and inspection of equipment installation in a manufacturing plant in Indiana. Construction will cost in excess of \$3,000,000 and will be supervised by the Louisville District Office of the Corps of Engineers.

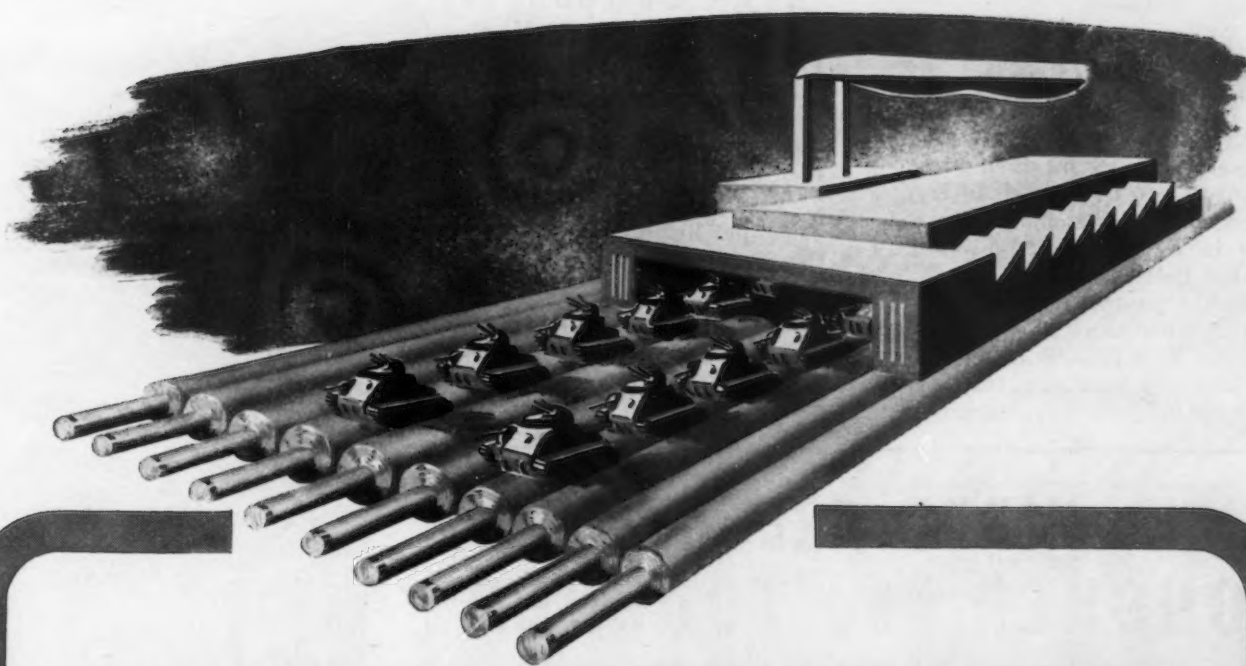
3. Award of a contract to Consoer, Townsend & Quinlan, Chicago, and the Kroening Engineering Corp. of Milwaukee, for architect-engineering construction of an Air Force Training School at Madison, Wis., to cost in excess of \$3,000,000. Construction will be supervised by the Milwaukee District Office of the Corps of Engineers.

4. Award of a contract to Carnegie-Illinois Steel Corp., Chicago, for consultant services and supervision of equipment installation in connection with the construction of a manufacturing plant in Indiana. Construction will be supervised by the Chicago District Office of the Corps of Engineers.

5. Award of a contract to W. E. Callahan, et al., of Dallas, Texas, for architectural-engineering services in connection with a manufacturing plant in Texas. Construction will cost in excess of \$3,000,000 and will be supervised by the Galveston District Office of the Corps of Engineers.

6. Authorization for expansion of facilities at a warehouse in Oklahoma, to cost in excess of \$3,000,000. Construction will be supervised by the Tulsa District Office of the Corps of Engineers.

7. Authorization for construction of an Air Force Training School at Goldsboro, N. C., to cost in excess of \$3,000,000. Construction will be supervised by the Wilmington District Office of the Corps of Engineers.



THE PRODUCTION LINE

Arcos Chromang electrodes weld armor right the first time—no re-welds—result: high production on the assembly line and high effectiveness on the battle line. Arcos keeps 'em rolling.

 **ARCOS CORPORATION**
401 N. Broad St., Phila., Pa.



"QUALITY WELD METAL EASILY DEPOSITED"

Distributors Warehouse Stocks in the Following Cities:

ATLANTA, GA.	J. M. Tull Metal & Supply Co.
BUFFALO, N. Y.	Root, Neal & Co.
BORGER, TEXAS	Hart Industrial Supply Co.
BOSTON, MASS. (Belmont)	H. Boker & Co., Inc.; W. E. Fluke
CHICAGO, ILL.	Machinery & Welder Corp.
CINCINNATI, OHIO	Williams & Co., Inc.
CLEVELAND, OHIO	Williams & Co., Inc.
COLUMBUS, OHIO	Williams & Co., Inc.
DETROIT, MICHIGAN	C. E. Phillips & Co., Inc.
ERIE, PENNA.	Boyd Welding Co.
FT. WAYNE, IND.	Wayne Welding Supply Co., Inc.
HONOLULU, HAWAII	Hawaiian Gas Products, Ltd.
HOUSTON, TEXAS	Champion Rivet Co. of Texas
KANSAS CITY, MO.	Welders Supply & Repair Co.

KINGSPORT, TENN.	Slip-Not Belting Corp.
LOS ANGELES, CALIF.	Ducommun Metals & Supply Co.
MILWAUKEE, WIS.	Machinery & Welder Corp.
MOLINE, ILL.	Machinery & Welder Corp.
NEW YORK, N. Y.	H. Boker & Co., Inc.
OKLAHOMA CITY, OKLA.	Hart Industrial Supply Co.
PAMPA, TEXAS	Hart Industrial Supply Co.
PITTSBURGH, PA.	Williams & Co., Inc.
PORTLAND, OREGON	Industrial Specialties Co.
ROCHESTER, N. Y.	Welding Supply Co.
SAN FRANCISCO, CALIF.	Ducommun Metals & Supply Co.
SEATTLE, WASH.	H. A. Cheever Co.
ST. LOUIS, MO.	Machinery & Welder Corp.
SYRACUSE, N. Y.	Welding Supply Co.
TOLEDO, OHIO	Williams & Co., Inc.

Steel Industry Payrolls, Employment Up in March

• • • A total of 653,000 steel employees was at work during March, according to the American Iron & Steel Institute, compared to 651,000 in February, and 613,000 in March 1941.

Steel payrolls amounted to \$116,998,000 during March, as against \$108,563,000 in February. In March a year ago, the payroll was \$98,025,000. Wage-earning em-

ployees earned an average of \$1.001 per hour in March—the first time on record that average hourly wages in the industry exceeded one dollar. In February, wage earners received an average of 99.5c. per hr., and in March, 1941, the average was 87.7c. per hr.

An average of 38.1 hr. per week was worked by wage earners in March, compared to 39.0 hr. per week in February and 38.5 hr. per week in March of last year.

THEIR HIDES ARE GETTING TOUGHER and TOUGHER

... placing added emphasis on the importance of using the right cutting and drawing lubricants for armor plate.



• These time-tested Stuart Oil Products are in wide use at principal tank building plants. Detailed application information is yours for the asking.

Stuart's
Thred Kut "99"

where straight cutting oil is indicated

Stuart's
SOLVOL
LIQUID CUTTING COMPOUND

for carbide tools and where an "aquamix" solution is recommended

Stuart's
"SUPER-KOOL"

for deep drawing, stamping, etc.

For All Cutting Fluid Problems

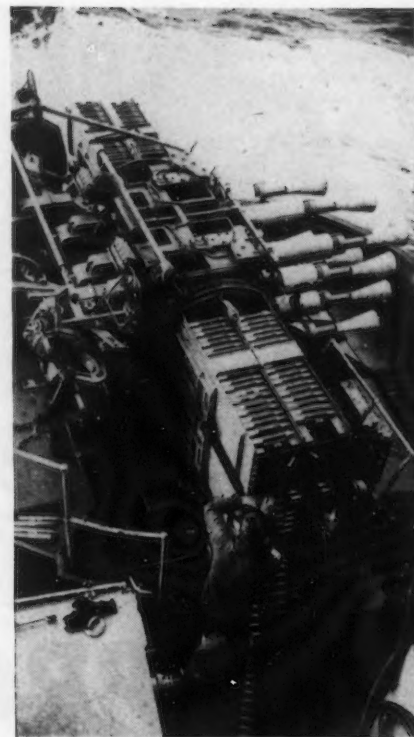
D. A. STUART OIL CO.

Chicago, U.S.A.

LIMITED

Est. 1865

Warehouses in All Principal Metal Working Centers



Wide World Photo

BELT LOADED GUNS: Belts carrying two pounder ammunition for the Pom Pom guns have been designed to speed the firing action of these formidable weapons. Here, on the deck of the H.M.S. Shropshire, a London Class, 8 in., cruiser, is shown one of the new installations.

Nine Automatic Ore Unloaders Being Built for New Furnaces

Cleveland

• • • Nine Hulett electric automatic unloading machines are reported to be under construction for use with new blast furnaces. Three will be of an entirely new design, particularly adaptable for unloading ore from the new, large boats. The units are to be completed by next summer, provided material difficulties do not continue. Inability to secure sufficient structural steel is holding up progress but the necessary steel plates are on hand. The unloaders are being made by the Wellman Engineering Co.

Youngstown Steel Door Co. Defers Quarterly Dividend

Cleveland

• • • WPB restrictions on railroad car building were blamed for Youngstown Steel Door Co.'s deferment of the usual second quarter dividend. The company will continue to convert facilities into war production.

~~FUEL OIL
NATURAL GAS~~

TIME IS SHORT!

*Change to
the Victory Fuel*

PULVERIZED COAL



TONNAGE INCREASE . . 15%
FUEL SAVINGS 38%
AMORTIZED IN . . 2 YEARS
OPERATION (*Automatic Control*)

FROM THIS — TO THIS

After changing from an obsolete system to the new AMCO Pulverized Coal System, this installation operated for over a year without the expenditure of a dime for maintenance. This means, in dollars and cents, that the new AMCO Furnace with pulverized coal equipment, was amortized within 2 years.

If you wish further information as to the possibilities in your plant, write us at once!



The Amsler-Morton Co., Fulton Bldg., Pittsburgh, Pa.

Please send us further information and booklet entitled "PULVERIZED COAL, the Victory Fuel."

NAME TITLE

COMPANY

ADDRESS

**YOU CAN ADAPT PULVERIZED
COAL TO YOUR PLANT**
why wait . . . MAIL COUPON TODAY



The **AMSLER-MORTON** *Company*

FULTON BUILDING • PITTSBURGH, PA.

Striking Structural Workers Return to Ohio War Plants

Cleveland

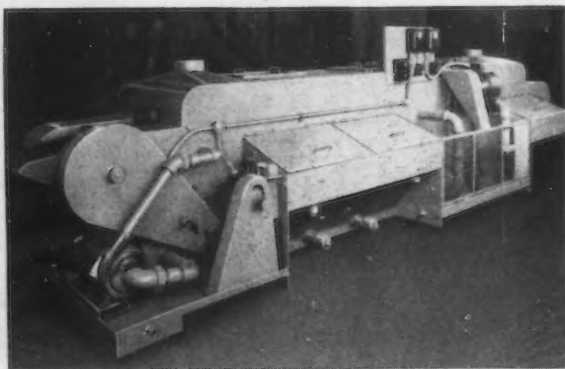
• • • Striking AFL structural iron workers, who had held up construction work at 13 Cleveland and one Warren defense plants since April 27, returned to their jobs on May 2 after several meetings with a joint arbitration board. The men stopped work because their attempt to secure a 12.5c. an hr.

pay increase since last Oct. 10 had not been settled, but after a week's idleness returned to work, pending further negotiations. All of the jobs halted were war projects and included Foundry Equipment Co., National Smelting Co., Cleveland Crane & Engineering Co., Parker Appliance Co., White Motor Co., Cleveland Graphite Bronze Co., Steel & Tubes, Inc., Ferro Enamel Corp., Steel Improvement & Forge Co., all in Cleveland.

when the big guns bark



RANSOHOFF METAL CLEANING EQUIPMENT



has played its part

RANSOHOFF Equipment is now operating in many plants cleaning projectiles of all sizes. The unit illustrated washes, rinses, and rust proofs 75 mm. projectiles, faster and better; saves valuable man hours, increases production and reduces costs.

Don't let your cleaning equipment be the "bottleneck" that slows up your production.

Consult RANSOHOFF Engineers; have them streamline your cleaning processes with RANSOHOFF Equipment. Designed to meet your specific requirements, from a survey made under actual working conditions.

RANSOHOFF - cleaned, metal products, means better final finishing and fewer rejects.

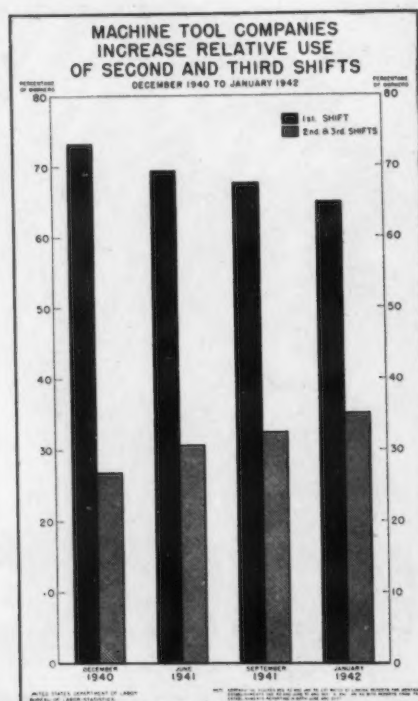
Write or wire Dept. "IA" for further details.

N. RANSOHOFF, Inc.

(METAL CLEANING SPECIALISTS)

TOWNSHIP AND BIG FOUR R. R.

CINCINNATI, OHIO



THREE SHIFT USE: The increase in the use of the second and third working shifts in machine tool plants is shown graphically. Comparative figures of December, 1940, and January, 1942, are estimated by linking reports for identical companies. The December, 1940, and June, 1941, reports and the September, 1941, and January, 1942, reports were linked with reports from 79 companies reporting in both June and September.

First Sub Built on Great Lakes Launched

Chicago

• • • First submarine ever built on the Great Lakes was launched from a shipyard in a neighboring state last week. Christened the U. S. S. Peto, the sub is the first on an order for a number of the underwater craft held by the Lakes shipbuilder. In the past equipment and parts have been made in Great Lakes yards but the Peto is the first complete submarine ever turned out on these inland waters.

Plant Idle 12 Years Gets War Contract

Vincennes, Ind.

• • • Link Track Engineering Co., idle for 12 years, began operations here a week ago, with a war contract. Only 60 workmen returned at the start but it is expected to increase the payroll to 250. Link Track is the successor to the Central Foundry, one of the city's leading industries.

Need Parts Like These?



These illustrations are purposely distorted and drawn out of scale.

SHAKEPROOF

is geared for volume production of high precision stampings and cold headed products!

Shakeproof offers the facilities of two modern plants thoroughly equipped for Die Making—Stamping—Drawing—Cold Heading—Thread Rolling—Heat Treating and Plating. And, a well-manned technical staff of competent metallurgists and experienced production, research and field engineers.

If you are in need of a reliable source for parts similar to those illustrated above, our organization has the experience and the equipment to quickly deliver a product of highest commercial standards.

Quotations can be furnished from blue-prints or one of our field engineers will gladly call for personal discussion.

SPEED ASSEMBLY WITH SHAKEPROOF FASTENINGS



Cowl Fasteners for Aircraft



Lock Washers



Thread-Cutting Screws



SEMS Fastener Units



Locking Screws



Locking and Plain Terminals

New 20-page booklet illustrates and describes the facilities of our two plants in detail. Available to company executives and government officials on request.

SHAKEPROOF inc.

Fastening Headquarters

Distributor of Shakeproof Products Manufactured by ILLINOIS TOOL WORKS
2501 NORTH KEELER AVENUE • CHICAGO, ILLINOIS
Plants at Chicago and Elgin, Illinois
In Canada: Canada Illinois Tools, Ltd., Toronto, Ont.

SEMS FASTENER UNITS • LOCK WASHERS • LOCKING AND PLAIN TERMINALS • THREAD-CUTTING SCREWS • LOCKING SCREWS
SPRING WASHERS • RADIO AND INSTRUMENT GEARS • COWL FASTENERS • SPECIAL STAMPINGS

CHECK YOUR NEEDS

...DO YOU HAVE THESE REFERENCES ON MODERN WEIGHING?

● Wartime production demands the utmost in weighing *accuracy* and *speed*. Whether it's a small scale for fractions of an ounce or the BIGGEST heavy-duty steel mill types or truck scales, built-in platform scales, hopper and tank scales... dial, beam or weight-printing scales... Look to Toledo for the answer! Send coupon for literature on *any* scale requirements.

This illustrated reference gives data on three lines of Toledo Motor Truck Scales... showing variety of modern installations.

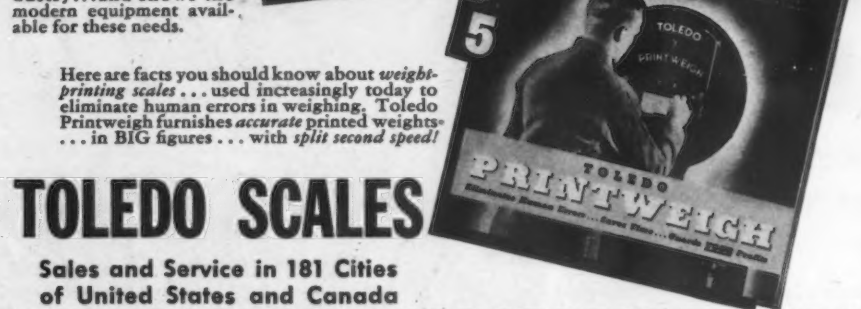


This 24-page booklet includes scales for counting unknown quantities... for issuing predetermined quantities... for counting in gross lots... for decimal count... for counting pieces per pound... other uses.

This widely used reference gives a broad view of modern scale applications in industry... and shows the modern equipment available for these needs.



Here are the essential facts on Toledo Heavy-Duty Floor Scales... showing the many long-life features of Toledo construction.



Here are facts you should know about *weight-printing scales*... used increasingly today to eliminate human errors in weighing. Toledo Printweigh furnishes *accurate* printed weights... in BIG figures... with *split second speed*!

TOLEDO SCALES

Sales and Service in 181 Cities
of United States and Canada

TOLEDO SCALE COMPANY, Toledo, Ohio.

Please send latest literature on the following:

- | | |
|---|--|
| <input type="checkbox"/> 1 MOTOR TRUCK SCALES | <input type="checkbox"/> 4 "45,000 WAYS TO WEIGH" |
| <input type="checkbox"/> 2 FLOOR SCALES | <input type="checkbox"/> 5 PRINTWEIGH |
| <input type="checkbox"/> 3 "COUNTING BY WEIGHT" | <input type="checkbox"/> TOLEDO SERVICE INSPECTION |

Save time... get accurate facts... call in a Toledo man for the solution of *any* weighing problem.

Name _____ Company _____

Address _____ City _____ State _____

'42 Steel Output In U. S. May Reach 87 Million Tons

By B. W. CORRADO

... A new study of potential steel output, based upon opinions of leading blast furnace, open hearth and scrap experts, indicates that resourceful furnace operators have gone a long way toward solving the scrap iron shortage, and that it is possible that our 1942 steel output may approximate 87,000,000 net tons. This estimate compares with a previous similar study (IRON AGE, Dec. 11) wherein the inadequacy of scrap had indicated that only some 80,000,000 net tons of steel would be produced this year.

The 7,000,000 net ton jump in the potential steel output is attributed to: (1) an almost 2,000,000 ton increase in pig iron output, thanks to the hard work of blast furnace crews and operators; (2) a potential 3,000,000 ton recovery of steel from some 7,000,000 gross tons of ore (over the 1941 total) that will probably be melted in open-hearth this year; (3) the expectation that there will be about 1,000,000 net tons of scrap available over our previous estimate of 21,000,000 net tons, as a result of Federal efforts to bring out scrap with the aid of Army action, Metals Reserve Corp. financing, and WPA labor.

The estimated 59,948,000 net tons of pig iron (see Table) that are expected to be produced this year are based upon indications that furnaces will continue to be

How Much Steel

Potential pig iron output	
Iron available for steel-making (86.5%)	
Estimated "purchased" scrap available	
Purchased scrap available to steel mills (75%)	
Total A plus B	
122.8% of this equals approx. steel output	
Resulting "home" scrap (29.7%)	
Total A plus B plus C	
90% equals approximate steel output	
Difference between X and Y (Formula check)	
STEEL REALIZATION FROM IRON ORE:	
Approx. steel recovery from extra iron ore	
TOTAL POSSIBLE STEEL OUTPUT (Y plus Z)	
Available capacity for steel (average)	
Idle steel capacity	
Scrap or iron needed	

Ed. Note: The symbols designated on chiefly for the convenience of the reader to of the calculations involved.

driven beyond their rated capacities, and that repairs will be kept at a minimum time interval, so that not too much production will be lost for this reason this year. Meanwhile, the new blast furnaces scheduled for completion this year are expected to be finished on time, while new sintering and ore-beneficiating facilities will aid in increasing the efficiency in blast furnace operations. The dark spot for this year is the coke situation, although it is possible that interference with pig iron production will be kept at a minimum by rehabilitation of old ovens and construction of new units.

Blast furnaces scheduled for completion at various dates in 1943 and 1944 may be substantially delayed due to the difficulty in securing turbo-blowers. However, estimated pig iron output for 1943 and 1944 accounts for this factor, as weighed against benefits to production that will probably result from greater sintering of flue dust, more beneficiating of ore, air-conditioning of blast furnaces, use of better coking coal, and other devices set forth in the Feb. 5 IRON AGE. If the blast furnaces under construction will be completed on scheduled dates in 1943 and 1944, pig iron output for both years is likely to exceed the estimates shown on the tables. It should be noted that allowance has been made for a greater amount of repairs that will probably prove necessary in 1943, and a larger concession for this purpose has been made for 1944.

The large amount of pig iron

Can We Produce?

	1942	1943	1944
...	59,948,000	65,216,000	66,416,000
...	51,855,000	55,208,000	57,450,000 (A)
...	22,000,000	22,000,000	22,000,000
(75%)	16,550,000	16,550,000	16,550,000 (B)
...	68,405,000	71,758,000	74,000,000
put	84,001,000	88,119,000	90,872,000 (X)
...	24,948,000	26,171,000	26,989,000
...	93,353,000	97,929,000	100,989,000
check)	84,017,700	88,136,000	90,890,000 (Y)
ORE:	16,700	17,000	18,000
...	3,000,000	4,000,000	4,500,000 (Z)
ore...	87,017,700	92,136,000	95,390,000
us Z)	89,500,000	93,500,000	99,000,000
...	2,517,700	1,364,000	3,610,000
...	2,750,000	1,500,000	4,000,000

the extreme right of the above table are permit an easier following of the sequence

ROEBLING Wires

ROUND... FLAT... SHAPED

A FEW WIRES TYPICAL
OF ROEBLING'S BROAD
SPECIALTY PRODUCTION

MADE TO YOUR
SPECIFICATIONS
TO SPEED
OFFENSE
PRODUCTION

Looking for ways to increase production...speed up deliveries? Do these round, flat or shaped wires suggest a short-cut to your Victory Program? You can save man-and-machine hours by having Roebling supply the right wires...made to exacting specifications of steel analysis, dimensions and finish...on schedule!

Trained along custom production lines, with the experience and facilities to tackle the tasks involved, Roebling has built a reputation solving problems in specialty wires.



JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities

that has been forthcoming from hard-pressed blast furnaces and the use of iron ore in the open hearth go a long way to explain why steel operations are so high, despite a continued scrap shortage. Growing scrap consumption by electric furnaces has reduced the amount available for the open hearth. Open hearth operators are now using melts approximating 50 per cent pig iron, 36 per cent scrap and 14 per cent iron ore, as

against normal practice of 50 per cent pig iron, 45 per cent scrap and 5 per cent iron ore. There have been cases where 150 tons of hot metal were charged into an open hearth along with 50 tons of iron ore, with no scrap used at all (see IRON AGE, March 5, 1942). The use of greater amounts of iron in relation to the amount of scrap available necessitates the addition of a larger amount of iron ore for oxidizing purposes, and the ab-

normal charges of this type made in recent months indicate that engineers are successfully melting iron ore in the open hearth and realizing about 40 to 50 per cent of the charge as metal. Since the accompanying table is based upon the normal furnace practice in dealing with scrap and pig iron statistics, the figures designated "approximate steel recovery from extra iron ore" are estimates of how much steel will be produced from the abnormal amount of iron ore that will be fed into our open hearths as long as the scrap shortage lasts.

With reference to the scrap situation, it continues fundamentally unfavorable, and this is reflected in "slag dump" mining, the poor average grade of bundles being shipped to steel mills, the large staffs that steel mills employ to comb the country for scrap, and efforts of the Army Ordnance De-

Foresight



that made this machine more valuable for War Production!

The magnetic chuck surface grinder pictured above is working 24 hours a day in a plant manufacturing tanks. It never has to be stopped a minute for speed changes. All the operator has to do is turn a control handwheel and the REEVES Variable Speed Transmission, installed within the frame, provides exactly the speed needed for grinding flat surface parts of all sizes up to a swing of 40 inches. With this ability to speed up and slow down as the work requires, production is faster and more accurate. Now—when the "heat" is on—REEVES-equipped machines are outstanding in performance. Increases of from 25 to 50 per cent in their output are not unusual. Send for catalog IG-419.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

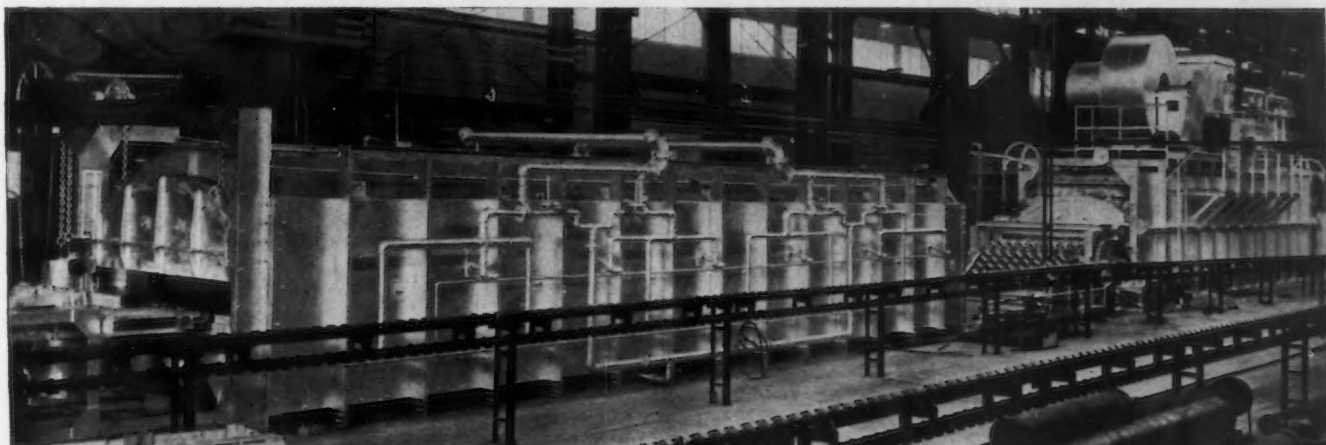
Reeves Speed Control

CONCRETE SUBSTITUTE: A new British building material, "Nashcrete," named after T. F. Nash the inventor, behaves like concrete, but has the added advantage in that it can be sewn together and nails drive into it with ease. It is lighter than concrete and contains a large proportion of sawdust.

Acme Photo

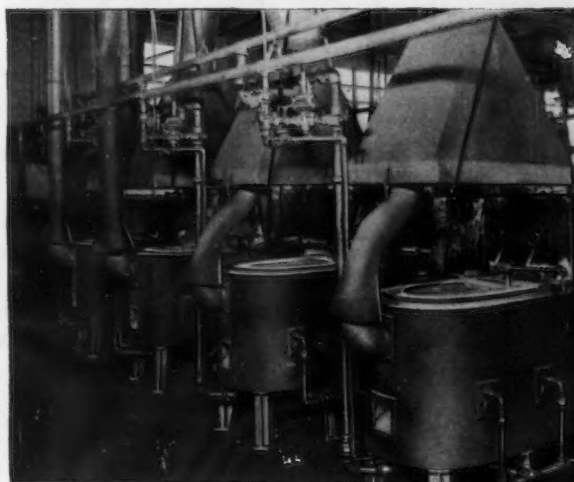


Heat Treating HIGH EXPLOSIVE SHELLS!



TRAINED ENGINEERS TO HELP

Our large corps of skilled furnace engineers are at your service to help you QUICKLY determine the simplest but most efficient furnace for your needs.



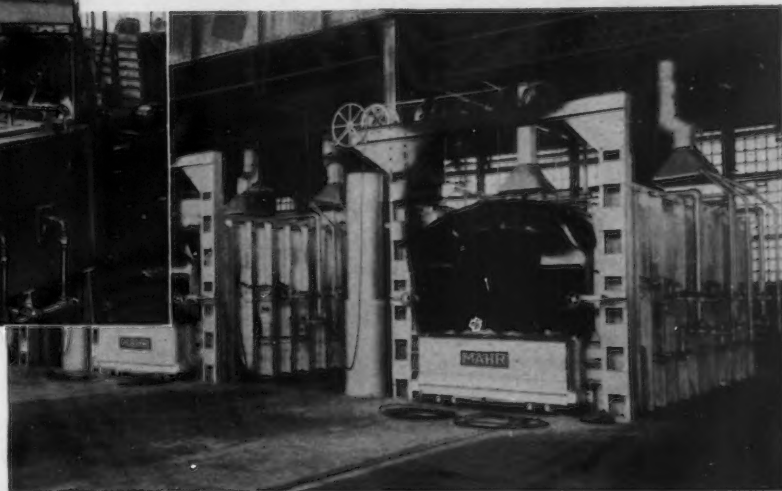
ASK FOR BULLETINS!

Special bulletins are prepared on all types of furnaces, forges, ovens, burners, blowers, etc. A representative is near you. WRITE OR WIRE TODAY!

or Carburizing Armor Plate Or Annealing Small Pieces

Or for doing *any* of the innumerable jobs of heat treating of metals and castings that are a *must* in today's production of the tools of war or the tools of peace—there's a MAHR furnace or oven design, tested in use and proven, ready for application to YOUR need.

We're in a war we've got to win! The tools for winning must be made NOW—FAST! They must be *right the first time*. So, for your heat treating jobs, specify MAHR furnaces — for over a quarter century known for highest quality, efficiency and DEPENDABILITY.



MAHR MANUFACTURING CO.

DIVISION OF DIAMOND IRON WORKS, INC.
MINNEAPOLIS, MINNESOTA, U. S. A.

partment and Bureau of Industrial Conservation to get after scrap "economically unavailable." If there were no scrap shortage, as is contended in some circles, none of these conditions would exist. It is true that there is an enormous amount of potential scrap available in the iron and steel in use throughout the country, but it is doubtful that it can be recovered year after year in the tremendous amounts required by our steel

mills and foundries. The miscellaneous scrap collected in the various "public drives" held throughout the country was generally below expectations, both in quality and quantity. Similar results are likely from the widely touted drive for farm scrap. On the other hand, the BIC may be able to free some scrap by Army seizures from "hoarders," by Metals Reserve Corp. subsidies for high-cost re-

claiming work, and by WPA labor where necessary.

Unfortunately, Federal representatives have issued many overgenerous estimates of how much scrap their efforts are bringing out, whereas checks with steel mills and foundries indicate that very little of it has actually been forthcoming to consumers. Thus, it is believed by conservative observers that the combined efforts of steel mill scouts and Federal agents may only yield an additional 1,000,000 net tons or so over previous estimates.

The accompanying table assumes that about 86.5 per cent of the pig iron produced will go to steel mills, on the basis of early 1941 shipments, and that about 75 per cent of the "purchased" scrap available will be used by steel mills, due to the unfavorable outlook for various gray iron foundries formerly producing consumers' goods. In the previous IRON AGE analysis (Dec. 11) based on 1936-40 experience, it was estimated that 85.7 per cent of the pig iron produced and 73.2 per cent of the "purchased" scrap available would go to steel mills.

Worker Training Institute Planned by WPB for Buffalo

Buffalo

• • • An institute to train workers for Buffalo war plants will be set up soon, E. M. Detwiler, Buffalo, training consultant of WPB's Training Within Industry Section, said this week. Detwiler, who is industrial relations supervisor for the Worthington Pump & Machinery Corp., said certificates as instructors have been awarded to 144 foremen of the Spencer Lens Co.

Consent Elections Seen For U. S. Steel Plants

Pittsburgh

• • • Within the next two weeks it is expected that the SWOC and U. S. Steel Corp. subsidiaries will have agreed to a stipulation calling for consent elections to determine whether or not the SWOC may have exclusive bargaining power at the various subsidiary companies. Some of the actual elections may be held before the SWOC convention begins at Cleveland on May 19.



fast *and accurate*

Accelerate defense production with no sacrifice of accuracy.

The Wells Metc! Cutting Band Saw has been designed for today's fast-moving production schedules. It speeds the cutting of almost any metal in a variety of shapes with assured accuracy. Hundreds of duplicates showing a variation of less than .005 inch in thickness are cut speedily without excessive friction and without the use of a coolant. Write today for full information.

WELLS MANUFACTURING CORPORATION • Three Rivers, Michigan

A large stock of blades is available at all times

**WELLS METAL CUTTING
BAND SAWS**

Wells SAWS
THE MARK OF SERVICE

SPECIFICATIONS

WELLS No. 8

Capacity: Rectangle 8" x 16"
(spec. bowed guides) 5" x 24"
Rounds 8" dia.
Speeds: ft. per min. 60, 90, 130
Motor Specifications optional

WELLS No. 5

Capacity: Rectangle 5" x 10"
(spec. bowed guides) 5" dia.
Rounds 5" dia.
Speeds: ft. per min. 60, 90, 130
Motor Specifications optional

NEWS OF INDUSTRY

Trade Notes • • •

Wesley Heat Treating Co., Milwaukee, has purchased the property of the Ada Grimm Foundry Co., Manitowoc, Wis. Frank Safranek, superintendent of the Milwaukee Wesley plant, will have charge of the Manitowoc operations.

National Acme Co.'s eastern office has moved from 125 Barclay Street, New York, to 744 Broad Street, Newark.

Standard Reamer & Tool Co. has moved from its former location at 2620 Elmwood Avenue, Detroit, to a new and larger plant at 2351 Hilton Road, Ferndale. The new plant has 10,000 sq. ft. of floor space.

Edward A. Lynch Machinery Co., Philadelphia, machine tool and metal working machinery distributor, will move May 1 to the Times Medical Building, Ardmore, Pa.

Alfred Hopkins & Sons have moved from Elkins Park, Pa., to East Union Street and Maple Avenue, Hatfield, Pa.

McDonald Hardware Mfg. Co., San Francisco, Cal., has changed its name to Dalmo Victor Co. Its products are no longer limited to items of hardware.

Thomas J. Donovan, Jr., and M. B. Berryman announced recently the formation of Donovan-Berryman Co., Philadelphia, a heat treating consultant organization. Both firm members were formerly affiliated with Hill Chase Co.

The shipbuilding plant formerly known as Todd-California Shipbuilding Corp. is now officially designated as Richmond Shipyard No. 1, of the Permanente Metals Corp., Richmond, Cal.

The Metallizing Co. of America has moved its Chicago general offices and midwestern warehouse to new quarters at 1330 West Congress Street.


Udylite Corp. has moved its eastern district office and warehouse from 60 East 42nd Street, New York, to 11-16 44 Drive, Long Island City, N. Y.

The Detroit Rex Products Co. has opened a New England branch office at 8 West Main Street, Meriden, Conn.

Lubri-Zol Corp., Cleveland, has assigned its interests to E. F. Houghton & Co., Philadelphia, which will manufacture, sell, and service Lubri-Zol lubricants. The Lubri-Zol sales staff in the retail division will be added to the Houghton sales organization.

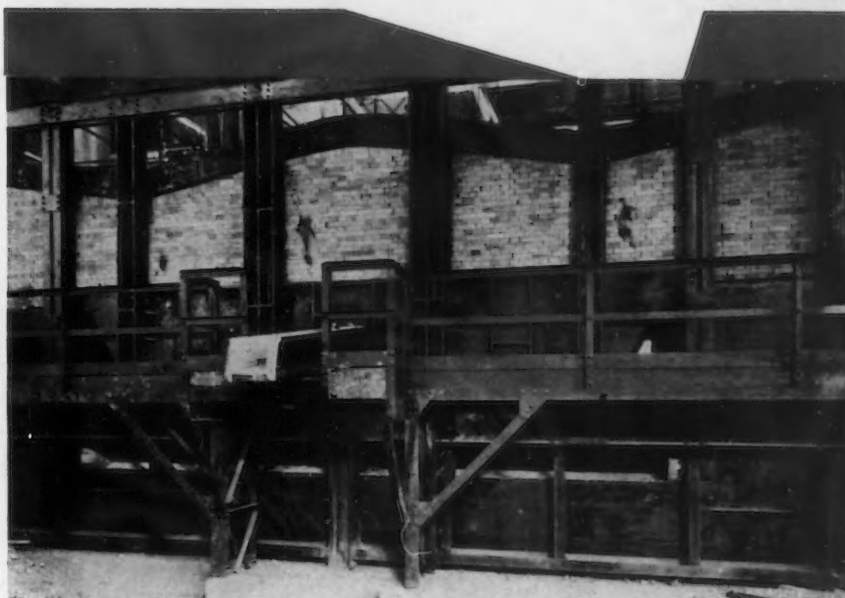
Anderson Spring Co., Cleveland, has moved to 1100 East 134 Street.

Swedish Steel Mills' A.A., Inc., Chrysler Building, New York, has changed its name to Hoyland Steel Co., Inc.



ARMOR
SHELLS
BOMBS
GUNS

**MORE STEEL CASTINGS
FOR WAR
DEMAND GREATER
FOUNDRY OPEN
HEARTH CAPACITY**



SWINDELL

Swindell 40-ton Open Hearth Furnace—one of many serving the metallurgical industry.

builds to this year's requirements
of MORE TONS PER HEAT . . .
through forward design and construction. Send in your inquiries
for additional data now!

SWINDELL-DRESSLER Corporation
DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES SINCE 1880
PITTSBURGH, PA.

J. & L. Operated at 106.2% in March

Pittsburgh

• • • Aside from shipping approximately 100 per cent of its total steel products (actual figures 99.97) on priority business, most of which it is understood involves high preference ratings for Army, Navy, lend-lease and Maritime requirements, it was disclosed here last week by H. E. Lewis, chair-

man and president, Jones & Laughlin Steel Corp., that the company is actually manufacturing 500 lb. semi-armor piercing and 1000 lb. demolition bombs, 90 mm. and 150 mm. shell forgings, special and new low alloy armor plate perfected by J. & L. metallurgists, and 46 small boats for the Navy at one of the company's fabricating plants.

It was also said that an all-time record in steel production was made in March when the com-



**Yes, WE HAVE HELPED
TO UPSET INDUSTRY**

We have helped to make scores of transitions from normal to war production—devised ways and means of adapting present equipment to the new demands—expedited government orders—introduced new production methods and rearranged plant layouts.

And we're still at it—with our sleeves rolled up—going strong—with a large staff of engineers bending every effort to get this important job done.

Let's keep 'em flying.

Pioneer
ENGINEERING & MANUFACTURING CO.
19649 JOHN R . DETROIT, MICHIGAN



MOLY REPLACES TUNGSTEN:

Here a molybdenum steel tool is taking a healthy cut on a large water-wheel generator ring. Molybdenum, 90 per cent of which is produced in this country, has by government order replaced to a great extent the tungsten formerly used in making high speed steel tools.

pany's primary steel facilities operated at 106.2 per cent of ingot capacity. Action will proceed on the exploitation of the company's Benson ore property in New York state, including a concentrating and sintering plant. All of this development will be financed to an extent of six and a half million dollars by government funds and J. & L. will operate the property under lease. J. & L. has appropriated 12 and a half million dollars of its own funds for new plant facilities and certificates of necessity have been requested with approximately \$11,000,000 of this total already issued by the government.

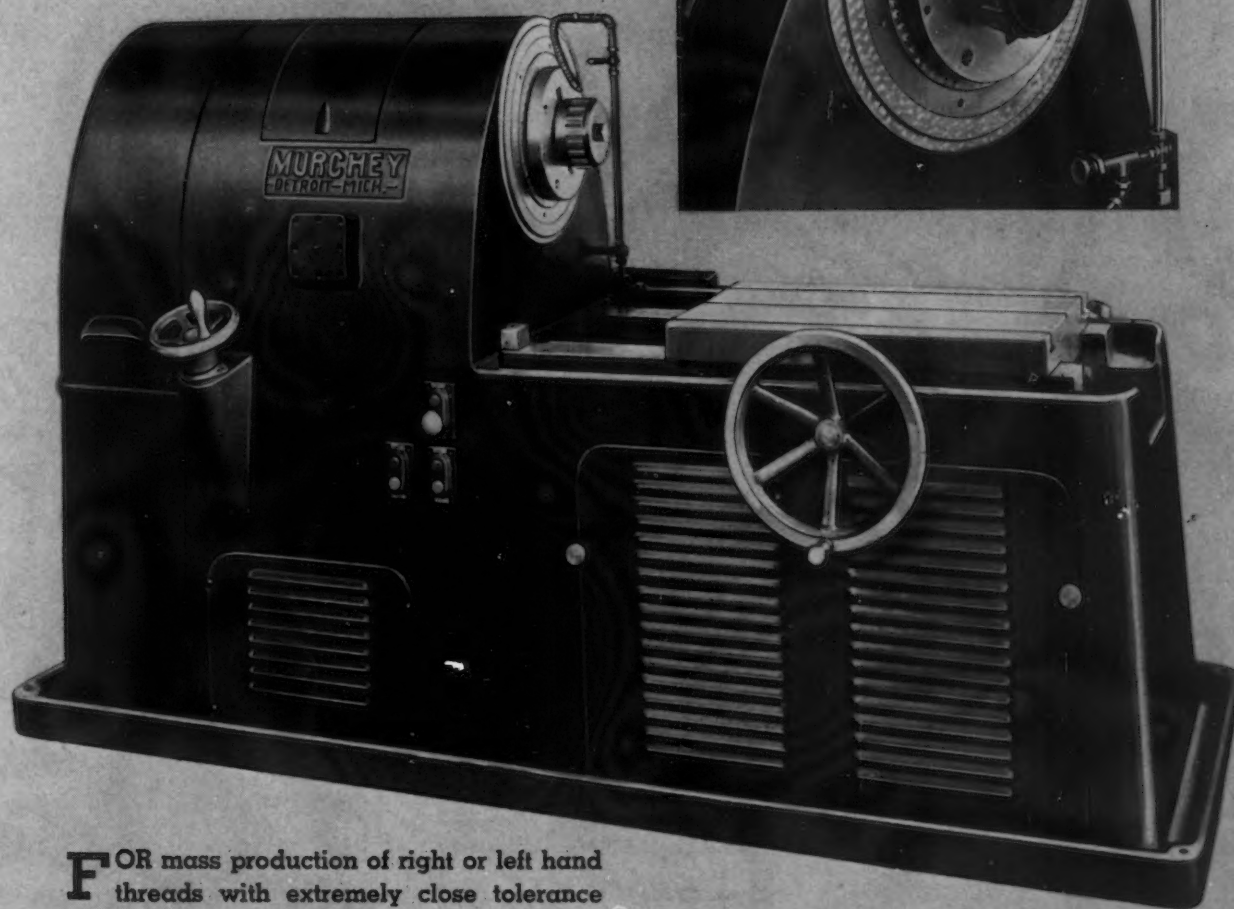
WPB Appoints New Chicago Director

• • • WPB announced that Joseph L. Overlook, former deputy assistant director of the OPM priorities division, has been appointed Chicago regional director. The Chicago regional office will administer all of the WPB field offices in Illinois, Indiana, Iowa, and a portion of Wisconsin.

Announcing

A NEW THREAD MILLING MACHINE

THE *Murchey* #42



FOR mass production of right or left hand threads with extremely close tolerance and absolute concentricity, internal or external from 4" to 12" dia. x 3" long by means of annular milling cutters covering the full length of thread.

The work table is quickly moved up to a stop after which the work remains stationary. The hob revolves on its own axis at 33 to 645 r.p.m., and also moves eccentrically 1.2 revolutions around the work for each threading

operation. The "throw" of the eccentric is adjustable up to $\frac{3}{4}$ ".

A hardened and ground lead screw imparts a forward motion to the eccentric spindle to produce an accurate pitch of thread. Here is a machine with automatic threading cycle that will solve many of your precision, large diameter threading problems.

Delivery from Stock

MURCHEY MACHINE & TOOL COMPANY
DETROIT, MICHIGAN

Inland Tells Why It Fights Closed Shop

Chicago

••• Reasons why Inland Steel will resist the imposition of so-called union maintenance by the War Labor Board were outlined recently by Wilfred Sykes, president, in a statement to stockholders. In reviewing the status of the SWOC-Inland Steel case now

before the War Labor Board, Mr. Sykes called for an expression of national labor policy by Congress to avoid strife and disunity. He said:

"For the past eight weeks, the company has been engaged in a closed hearing before the Fact Finding Panel of the War Labor Board, with the Steel Workers' Organizing Committee.

"At the request of the chairman of the panel, both sides

pledged themselves not to reveal what transpired in the hearing room, but at the close of (Inland) testimony last week that restriction was lifted.

"In about four weeks, the matter will reach its climax in a public hearing before the War Labor Board itself.

"On the question of whether a worker should be free to remain in our employ without the necessity of belonging to any particular union we have taken a firm position. In the midst of a great national crisis, questioning the right of a man to work unless he pays tribute to a labor organization, can only bring about strife and disunity.

"We feel that this is a question which, if faced honestly, would be submitted to Congress for an expression of national policy, and that it is not properly a subject for arbitration by the War Labor



Pyott Multiple V-Belt Drives conform to all the engineering specifications established by Multiple V-Belt Drive Association.



SHEAVES

GEARS



PYOTT

FOUNDRY & MACHINE CO.
328 NORTH SANGAMON STREET • CHICAGO

Put your drive problem up to Pyott for constructive suggestions. Descriptive literature sent upon request.

FLYWHEELS

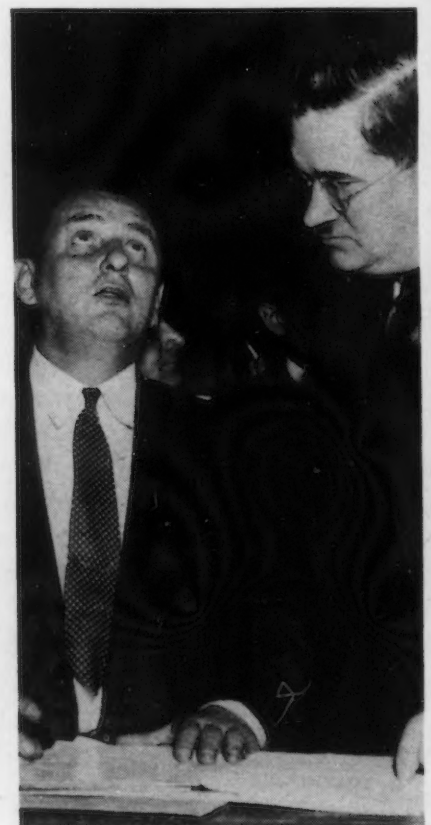


SPROCKETS

ALSO GREY IRON AND SEMI-STEEL CASTINGS

COMMODITY PRICE FREEZE: A sweeping order freezing prices of general commodities at March levels was announced this week by Leon Henderson. Here, Henderson talks with Donald Gorden, chairman of War Time Prices Trade Board of Canada, who attended the conference.

INS Photo



ARMAMENT PLANTS... STEEL FOUNDRIES... STEEL MILLS
... RAILROAD SHOPS... SHIP YARDS... JOB-WELDING
SHOPS... AND GENERAL FABRICATORS ARE USING

NATIONAL No. 5 OXY-ACETYLENE CUTTING MACHINES TO *Speed Production!*

A No. 5 may solve one (or more) of your production problems
... request all the facts!

9
WAYS
the
No. 5
CAN HELP
*Speed Your
Production!*

Straight-Line Cutting

Straight and Bevel Cutting

Strip Cutting

Stack Cutting

Circle Cutting

Billet Cropping

Simple
Irregular Cutting

I-Beam Cutting

Concentric
Cutting

... and many special applications to meet individual job requirements.

NATIONAL CYLINDER GAS COMPANY

205 W. Wacker Drive

Offices in Principal Cities

Chicago, Illinois

Board. We have so expressed our opinion.

"But, an interesting development is taking place which is not fully understood. Public indignation against the use of the war emergency to impose the closed-shop upon industry has been so vigorous and so widespread that the War Labor Board has recently been substituting what it calls union maintenance. And, because that phrase is new and different,

the public does not understand the implications of what the board is doing.

"In many respects 'union maintenance' is a more undemocratic procedure and more dangerous to American institutions than the closed-shop itself. Ostensibly it is a voluntary freezing of his own union status by the worker. He agrees that his dues shall be checked off by the employer and

remitted directly to the union for the life of the contract.

"Thereafter, however, he never can withdraw. No matter how he may disapprove of the conduct of his union officials, he is powerless to resign. The right to withdraw from a union is the worker's inherent right of protest, just as much as his right to refuse to work for the company if he does not like the conditions existing in our plants.

"And, there is the further difficulty that the employee's initial authorization of the check-off may in fact not be voluntary. Those who have watched dues picketing by the union outside the gates of our plant know that not only are many subtle forms of coercion employed to obtain union memberships, but that often actual physical violence has been used.

"For the foregoing reasons we believe that union maintenance agreements are wrong, and we shall continue to resist them.

"Our bargaining record with the Steel Workers' Organizing Committee is excellent, our compliance with the Wagner Act has never been successfully questioned, and we shall submit our record to the War Labor Board with entire confidence that there are no circumstances which would justify their imposing so-called union maintenance upon us against our will.

"Not only the closed-shop demand on us, but the request for an increase of \$1 a day in pay for each worker is contrary to the national interest in wartime.

"The economic question involved in the wage demand is really one that should be determined as a part of a national wartime labor policy, since the reasons advanced by the union in support of their demand apply to every industry in the country. Because our company is in the highest bracket of excess profits taxes, it is estimated that perhaps as much as 85 per cent of the increase would be paid by the government through the medium of loss in taxes."

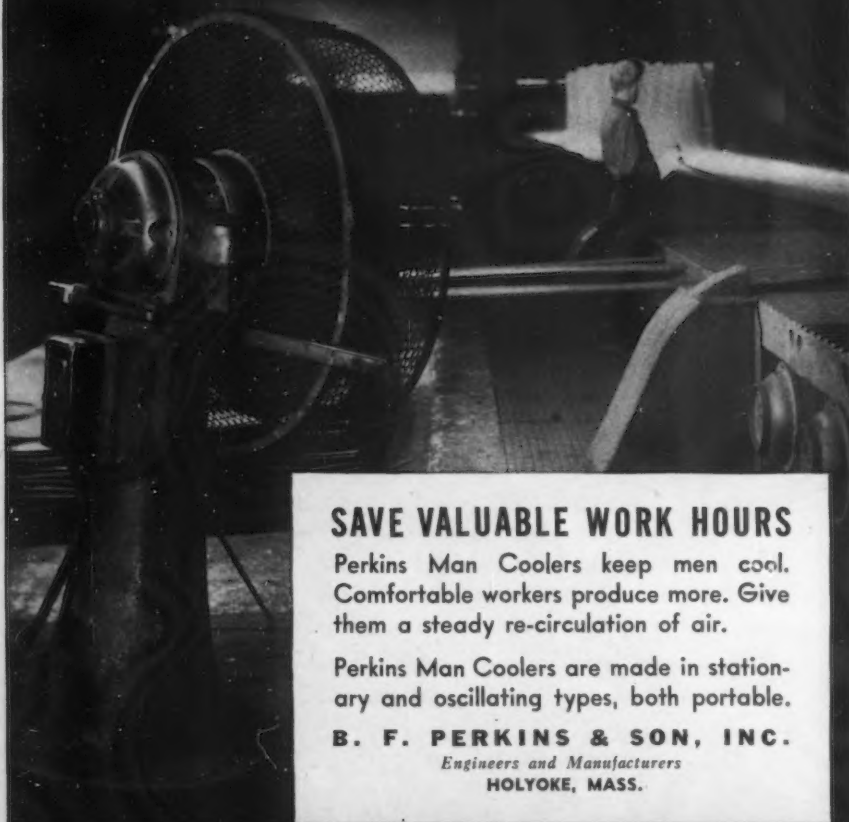
Warren Tool Expands

Warren, Ohio

••• Warren Tool Corp. is expanding its plant to provide additional manufacturing and heat treating facilities.

PERKINS MAN COOLERS

TRADE MARK REGISTERED UNITED STATES PATENT OFFICE



SAVE VALUABLE WORK HOURS

Perkins Man Coolers keep men cool. Comfortable workers produce more. Give them a steady re-circulation of air.

Perkins Man Coolers are made in stationary and oscillating types, both portable.

B. F. PERKINS & SON, INC.
Engineers and Manufacturers
HOLYOKE, MASS.

B. F. PERKINS & SON, INC.
ENGINEERS AND MANUFACTURERS
HOLYOKE • • • MASSACHUSETTS



Acme photo

Photo
Wayne Pump Co.

This naval anti-aircraft pom-pom battery sprays a pattern of 2 pound shell as a shotgun covers a flying clay target. With it a crack gun crew can quickly turn an enemy dive bomber into a "dead pigeon."

Each gun fires and reloads automatically with amazing rapidity. Yet its speed is hardly more amazing than that with which these same shell pass through the DeVilbiss Spray System that Wayne Pump Company uses for painting them. They enter as bare metal and come out automatically coated with

Stuka Stoppers

asphalt inside and gray lacquer outside, dry and ready for loading, at a rate of 800 an hour.

Wayne's choice of equipment grew from years of experience with DeVilbiss Systems for finishing its well-known gasoline and oil pumps—plus the speed and efficiency these systems have shown in painting innumerable other types of arms and munitions in factories, arsenals and shipyards everywhere.

Our national need for increased war production is clear. Yet no assembly line can run faster than its finishing department. If your share in the job ahead means greater output — greater speed — prepare for it NOW by installing modern DeVilbiss Spray Painting Equipment.

THE DEVILBISS COMPANY • TOLEDO, OHIO
Canadian Plant: WINDSOR, ONTARIO

THE COMPLETE DEVILBISS LINE CONSISTS OF: Spray finishing equipment • Automatic coating machines • Tanks for spray materials • Spray booths and exhaust fans for vapor and dust elimination • Air regulators, cleaners and dusters • Air compressors • Respirators • Specialized hose for paint, air, water, gasoline, welding and pneumatic tools • Hose connections • Water and oil guns • Equipment to prevent offset in printing • Paint strippers • Medicinal atomizers • Perfume atomizers.



DEVILBISS SPRAY SYSTEMS

\$6,140,688 Netted by Bethlehem Steel Corp.

• • • A net profit of \$6,140,688 was reported by Bethlehem Steel Corp. for the quarter ending March 31, 1942, after a deduction of \$19,190,000 for taxes based on tax laws now in effect and an additional \$5,000,000 for anticipated increases in Federal taxes during 1942. These earnings compare

with a net income of \$10,436,028 for the same period last year, when \$7,270,000 was provided for taxes.

Steel production during the first period of 1942 averaged 98.0 per cent of capacity as compared with 103 and 100.3 per cent during the fourth and first quarters of 1941, respectively. According to E. G. Grace, president, the lower operations during the 1942 initial period were due entirely to insufficient

supplies of scrap, and it is his belief that unless new blast furnace capacity is brought into operation as quickly as possible, the steel industry as a whole will suffer during the coming winter.

Mr. Grace stated that the entire Navy construction program, in so far as Bethlehem was concerned, is substantially ahead of schedule, and the situation is expected to improve. The company's part in the merchant ship program is up to schedule.

Net income for the March quarter, Mr. Grace pointed out, represented a return of 2 per cent on the quarter's billings, against 3.6 per cent return for the like 1941 period. On an investment basis, the earnings indicated an annual return of 4.67 per cent, as against the 1941 return on invested capital of 6.09 per cent. Tax deductions for the first quarter were at the rate of about 80 per cent of profits before taxes, as compared to 71.2 per cent for 1941.



Inland Steel Reports

Chicago

• • • Net income of Inland Steel Company after provisions for federal income and excess profits taxes, for the first quarter, totaled \$2,528,090, as compared with \$3,469,046 earned during the initial period of 1941. Federal tax provisions for the first quarter provided for on the basis of the 1941 tax laws, total \$5,443,000 with an additional \$1,300,000 added for expected increases. Taxes for the 1941 period totaled \$3,317,175.



Wheeling Nets \$1,200,090

• • • A net profit of \$1,200,090 was shown for the first quarter by Wheeling Steel Corp., after depreciation, depletion, interest, and a \$2,625,000 provision for federal taxes. This profit compares with \$1,981,009 earned during the first quarter of 1941.



Republic Earns \$4,716,962

Cleveland

• • • For the March quarter, Republic Steel Corp., reported a net profit of \$4,716,962 after deducting

OVER 75 TYPES KOPPEL

INDUSTRIAL CARS

TO HELP YOU

CUT HAULAGE COSTS SPEED UP OPERATIONS INCREASE PRODUCTION

Choose your cars from the widely diversified Koppel line of over 75 specific types of Industrial Cars, and you'll be sure of top haulage efficiency with rock bottom maintenance. Get all these advantages, —specify Koppel!

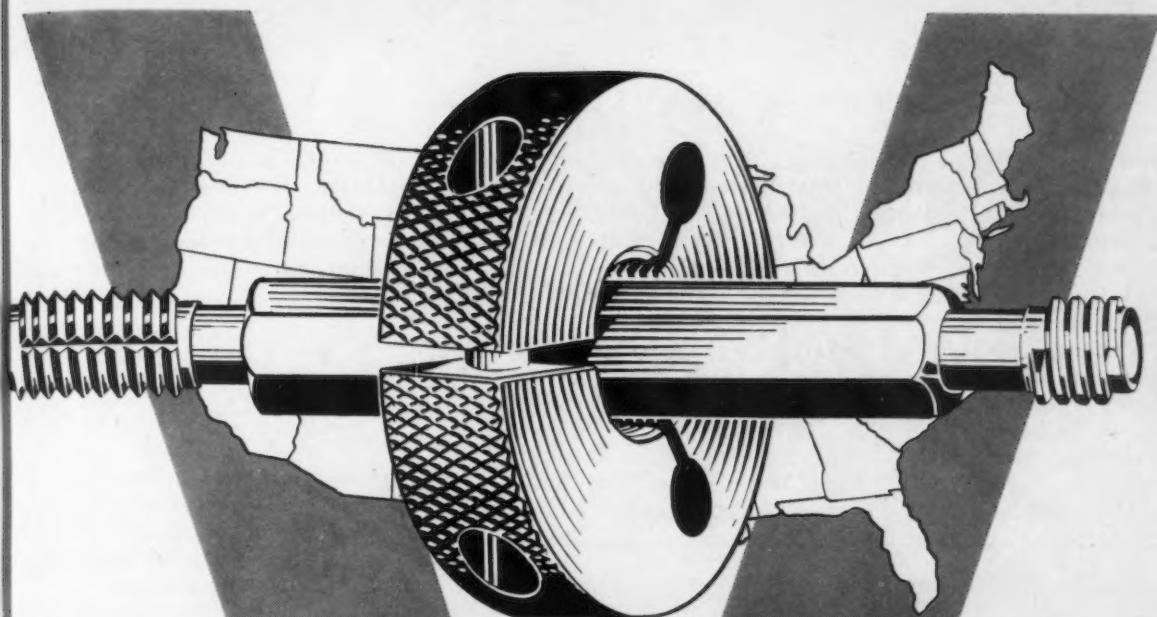
- ▶ High Pay Load Capacity.
- ▶ Quick, Clean Dumping Action.
- ▶ Rugged Durability.
- ▶ Minimum Maintenance Per Ton.
- ▶ High Tensile and Abrasive Resistant Steel Construction when Desired.



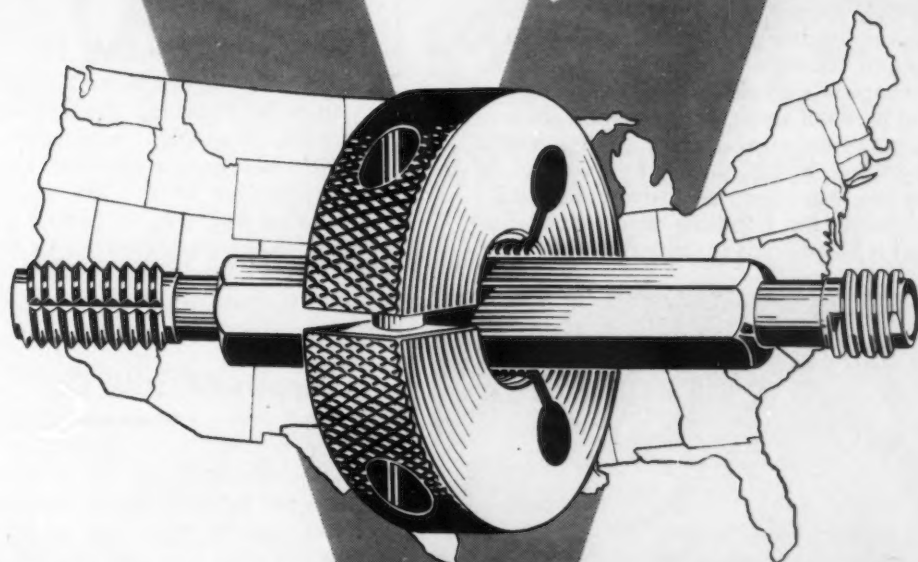
Do you have our
Bulletin 71 on file?

PRESSED STEEL CAR COMPANY, INC.

(KOPPEL DIVISION)
PITTSBURGH, PA.



DETROIT TAP'S 1942 THREAD GAGE CAPACITY



TOTAL U.S. PEACE TIME THREAD GAGE REQUIREMENTS

All "Detroit" thread gages, both ring and plug, are made from special alloy steel of highest wear-resisting properties. Many sizes stocked. Others available on quick delivery.



DETROIT TAP &



TOOL *Company* 8432 BUTLER DETROIT

THREAD GAGES
RING & PLUG

TAPS
SPECIAL & STANDARD

\$18,000,000 for federal taxes. This compares with net earnings of \$8,189,967 during the corresponding period of 1941, when provisions of \$8,025,000 were made for taxes.

Extension of manufacturing facilities by Republic, made necessary because of intensification of the all-out war production effort, is being made. Electric steel capacity, already increased, is being further stepped up, as is the production of light armor plate for aircraft, trucks, and land vehicles.

A large gun bloom forging plant is under construction, and a rough-turned and bored gun forge plant has been authorized. Plate production as well as pig iron output has been substantially increased.



Alan Wood Steel

Philadelphia

• • • Alan Wood Steel Co., and subsidiaries reported for the quar-

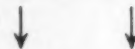
ter just ended a net income of \$217,041 after provision of \$520,000 for federal and state taxes. This compares with revised net income of \$351,794 for the first quarter of 1941.



Carpenter Steel Co.

Reading, Pa.

• • • Carpenter Steel Co., for the quarter just ended, reported a net profit of \$626,777, compared to \$614,280 earned during the same period last year. Provisions of \$986,321 were made for federal and state taxes. The net income during the past quarter is equal to \$1.74 a share on 360,000 shares of capital stock.



Superior Earns \$141,786

• • • The first quarter, 1942, earnings of Superior Steel Corp., totaled \$121,786, compared with \$228,364 earned during the first quarter of 1941. Tax provisions totaled \$429,000, including \$63,000 for expected increases in the tax rates.



Copperweld Steel Co.

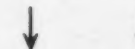
• • • After deduction of \$654,391 for federal and state taxes, the Copperweld Steel Co., reported a net profit of \$199,119 for the initial quarter of 1942. This compares with an adjusted net profit of \$331,818 for the same period last year. Tax provisions during that period were \$667,950.



Midland Steel Products Co.

Cleveland

• • • Net earnings of the Midland Steel Products Co. for the first quarter of 1942 amounted to \$176,073 after all charges and provisions for federal taxes on income. This compares with \$543,643 earned during the first quarter of 1941.



J & L 12 Month Earnings

Pittsburgh

• • • For the 12 month period ending March 31, 1942, Jones &

Prime movers

... FOR AMERICAN WAR PRODUCTION

• The great units of America's transportation system, her trucks and trains, depend heavily upon another transportation system to keep them rolling — the modern conveyer system! Without conveying equipment to speed materials to and from processing machinery, and into the cars and holds of ships, the transportation of vital war material would slow down considerably. Ships would remain longer in port — carloadings would fall off.

Long Mathews engineering hours are devoted entirely these days to the development of equipment for handling war material so that our prime movers can get it to where it is needed in less time.



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.



**MATHEWS
CONVEYER CO.**
ELLWOOD CITY,
PENNSYLVANIA

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION



Victory calls for Strategy

IN WAR PRODUCTION, TOO

● The success of American *war strategy* depends upon the production of more armament for Victory. To build it faster and better, calls for *industrial strategy*.

Van Dorn has a distinguished "board of strategy" on arms production—manufacturing technicians, welding experts, heat treating specialists, skilled machinists—backed by 64 years of metal fabricating experience. They know war production from past service. They're trained to get production orders rolling sooner, to keep them moving faster, to turn them out better. They have one of industry's greatest batteries of modern, high-speed metal-working equipment.



Every cog in this vast Van Dorn machine has been working "under forced draft" for Victory—building aircraft armor to keep our war birds fighting—fabricating gun shields to keep our artillery squads firing—producing armor plate to keep our tank crews in action.

But our large and capable staff of engineers and designers has a hand free to help you on product development work—to gird your product for the all-out selling campaigns after the shooting is over.

There's no cost for this Van Dorn product engineering service—nothing to obligate you. Ask one of our engineers to explain it. Write, wire or phone, today.

THE VAN DORN

IRON WORKS COMPANY

2685 EAST 79th STREET • CLEVELAND, OHIO

DESIGNERS AND BUILDERS OF PRISON EQUIPMENT SINCE 1878

Laughlin Steel Corp., and subsidiaries report a net profit of \$14,606,194 including the provisions of \$16,810,060 for federal income and excess profits taxes. For the first quarter, a net of \$2,491,718 was reported, compared with \$4,160,507 earned during the corresponding 1941 quarter. The consolidated 12 month account was made available to security holders of the corporation and other interested parties pursuant to the agreement made in connection with the sale of \$28,000,000 principal amount of

J & L First Mortgage Bonds, Series C, 3¼ per cent, due Jan. 1, 1961. The registration statement for these bonds was filed with the SEC on Jan. 3, 1941, and became effective Jan. 14, 1941.

Wabash Buys 3 Locomotives

St. Louis

••• Wabash Railway Co. has bought two 660 and one 1000-hp. diesel electric locomotives from the Baldwin Locomotive Co.

Church Organ Plant Gets Into War Work

North Tonawanda, N. Y.

••• The Rudolph Wurlitzer plant, which formerly manufactured coin-operated phonographs and church organs, now is swinging into war work, with output expected to reach capacity in July.

Purnell Points to Rapid Rise in Costs and Taxes

Youngstown

••• The hope that "steel prices will be adjusted accordingly" as increased taxes and rising operating costs narrow the profit margin of steel producers under OPA fixed price ceilings was expressed by Frank Purnell, president Youngstown Sheet & Tube Co. at the April 28 stockholders' meeting. Mr. Purnell pointed out that \$26,600,000, equivalent to about \$16 per common share, was paid in taxes in 1941 and that 1942 taxes are expected to be substantially higher. He emphasized that although the OPA froze prices on April 16, 1941, costs were advancing on "practically every item used in steel manufacture, including machinery and equipment." It is hoped that "as taxes and other production costs continue to mount so as to result more unfairly to producers the OPA will recognize the situation and adjust prices accordingly." He stressed the importance of high depreciation rates, in view of the fact that 100 per cent operations are increasing wear and tear on equipment and thus resulting in high maintenance costs.

"We do not believe inflation can be avoided by government control of prices while purchasing power is being continuously increased and expanded by wage increases. It should be kept in mind that, if corporate profits should be abolished, the source of very substantial tax revenue will be destroyed."

Over 2000 employees are now in the armed services, 90 per cent of present employees are buying war bonds and the company is cooperating in war production by discontinuing some products not needed for war and making other items vitally needed.

Ask

MEAKER!

Equipment for
GALVANIZING
 (Electro Process)
PICKLING
CLEANING
PLATING

At your Service . . . the country's
 leading practical plating engineers.

ADDRESS:
The MEAKER co.
 1635 So. 55th Ave., Chicago



War
is waged at a terrible cost

BUT

*To lose the war,
the cost is beyond measure!*



BUY WAR BONDS & STAMPS

*Ohio Ferro-Alloys Corporation
Canton, Ohio*

105,000,000 Tons of Steel

This staggering total, which is about 16,500,000 tons more than the rated ingot capacity of the United States steel industry, is the annual estimated requirement for Army, Navy, Maritime Commission, Lease-Lend and industries essential to the war effort.

Until further expansion of our steel industry is completed no such amount will become available.

The closer we come to it, however, the more quickly will our industrial preparations for all-out war approach realization.

With sufficient pig iron and scrap, some steel plants can and have operated at 105 per cent or more of their rated capacity.

New blast furnaces now under construction will give the industry more pig iron, but an adequate and increasing supply of scrap will depend on the combined cooperation of the scrap industry, industrial companies, the public and the various Government agencies now engaged in scrap salvage campaigns.

The job of providing the steel industry with enough scrap is not for a week or a month, but for the duration. Lend a hand in your own plant by turning into scrap anything that will increase our steel supply for more ships, more airplanes, more guns, more of everything needed to win the war.

The **CHARLES DREIFUS** Company

(Brokers in Iron and Steel Scrap for 40 years)

Philadelphia, Pa. Pittsburgh, Pa.
Widener Bldg. Oliver Bldg.
Rittenhouse 7750 Atlantic 1856

Worcester, Mass.
Park Bldg.
Worcester 6-2535

NEWS OF INDUSTRY

Steel Welding Wire Output Reaches 453,120,000 Lb. in '41

••• Production of steel welding wire by the steel industry in 1941 totaled approximately 453,120,000 pounds, a new high record, according to the American Iron and Steel Institute.

Last year's output was nearly 90 per cent greater than the 238,795,000 pounds of welding wire produced in 1940 and 147 per cent greater than the 183,436,000 pounds made in 1939.

The sharp increase in the manufacture of welding wire last year reflects in part the heavy production of war equipment of all kinds.

From 1932 to 1941, production of welding wire rose 1776 per cent. That gain was nearly four times as large as the increase in steel ingot production since 1932.

For each ton of finished steel produced last year, over 7 pounds of welding wire were made, compared with nearly 5 pounds in 1940, and approximately the same figure in 1939.

In 1932, about 2.6 pounds of welding wire were produced for every ton of finished steel products manufactured.

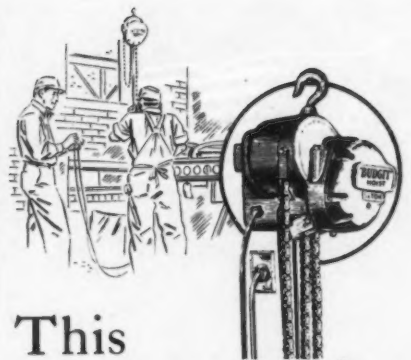
Cleveland Pneumatic Tool Forms Subsidiary

Cleveland

••• Cleveland Pneumatic Tool Co. has formed a subsidiary, the Cleveland Pneumatic Aerol, Inc., in Columbus. It is expected to engage in war work in a new plant at an undisclosed site. John De Mooy, president, and Daniel C. Green, chairman of the board, of Pneumatic Tool, will serve in similar capacities on the staff of the new subsidiary.

Wyckoff Gets Navy "E"

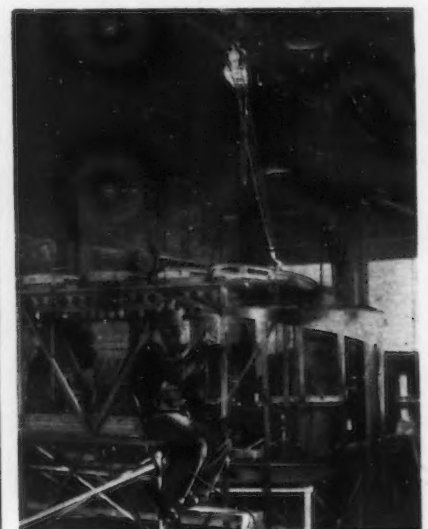
••• Wyckoff Drawn Steel Co., Pittsburgh, has received the top Navy award for achievement in production, the All-Navy "E" burgee. This added recognition came to Wyckoff as the company announced a new production record exceeding all previous monthly records and setting a new high for the fourth consecutive time since the company received the original Navy "E" award in January.



This speeds production

ELECTRIC 'BUDGIT' HOISTS are invaluable in production lines and for other places where lifting is done. The worker produces more at less cost, is free from the danger of strain and rupture, and maintains top efficiency through long hours. Installation is as simple as this — hang up, plug in and use. Hundreds of industries, with thousands of installations are profiting from 'Budgit' Hoists.

'Budgit' Hoists are portable, electric hoists with lifting capacities of 250, 500, 1000 and 2000 lbs. They are priced from \$119 up. For complete information, write for Bulletin 348.



Send for catalog containing complete information on Hoists, also, "Time Saving Calculator" that shows savings they earn.



'BUDGIT' Hoists

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of Ashcroft Gauges, Hancock Valves, Consolidated Safety and Relief Valves and 'American' industrial instruments.

The Women Watch ... Not Wait

■ Old wives' tales of many wars ago tell of the women who watched and waited for their warriors' return. Not so today . . . over 500,000 women are engaged in active war production jobs . . . estimates indicate that later 2 million women will bolster essential industries replacing men in the service.

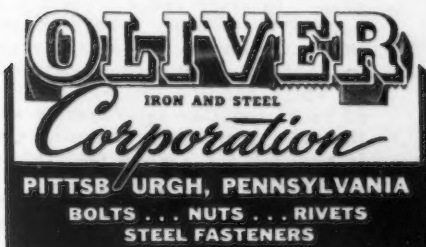
Today our working women *watch* . . . but *do not wait*, for they are filling an important responsibility in material and product inspection, assembly work, machine operation



and hundreds of precision tasks. At Oliver Iron and Steel Corporation alone over 200 women do a man-sized job of threading, pointing, inspecting, sorting and packing Oliver Bolts, Nuts, Rivets and Steel Fasteners of all types for hundreds of applications in armament and essential industries.

Part of the dependability, accuracy and precision which you can always recognize in Oliver products is directly attributable to the skill and dexterity of these women. Into every Oliver product goes something more than just the demands of your specification . . . there's pride and workman-like skill, proved design that's checked with your ultimate uses and the experience and "know-how" of many years.

We, at Oliver Iron and Steel Corporation have learned how to cut a lot of production snags and get needed material delivered for vital applications. Why not check your steel fastening needs with us today?



NEWS OF INDUSTRY

21,984 Steel Employees Join Services, 18,054 Deferred

• • • Nearly 22,000 employees of the steel industry entered military service during the 15 months ended Dec. 31, 1941, according to a survey by the American Iron and Steel Institute.

Of a total of 21,780 requests for occupational deferment of steel workers up to Dec. 31, 18,054 were granted, 1273 were denied, and 2453 were still under consideration. The survey indicated that for several months after Selective Service enactment, some steel companies requested few occupational deferments. Later, however, acting on suggestions to all war industries by Selective Service officials, steel companies more generally asked deferment for essential workers. Since actual warfare, local draft boards have indicated that they may tighten deferment requirements.

The replacement of the 21,984 men called into military service was accomplished without serious production curtailment, largely through quick training courses for new workers.

Buffalo Priority Staff Increased After Complaints

Buffalo

• • • Problems of war industries here will receive quicker action as result of the WPB to "more than double" the technical staff of the Buffalo office. District Manager Paul R. Smith of the Priorities Division of the WPB said the staff here will be increased by adding eight or nine more men to the present staff of five. The increase is believed a "reply" to criticism of the methods of handling priorities made by a group of 44 manufacturers at a meeting in Buffalo last month.

Buffalo Area Employment Up 19% From Last Year's

Buffalo

• • • More than 1600 factory workers were added to payrolls of 174 plants in the Buffalo-Niagara Falls industrial area last month, raising total employment in these plants to more than 108,600, the Buffalo Chamber of Commerce reported this week. A year ago, factory employment in the district totaled 91,350 workers.

Liberty Ships on Schedule

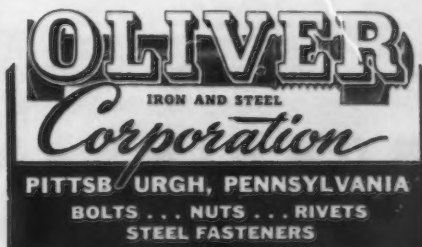
■ Shipyards from Bath and Norfolk to Seattle are concentrating on building Uncle Sam's new merchant marine . . . a bridge of Victory supply ships 'round the world . . . a ship program destined to be the largest and most quickly constructed in the world. Now geared to a speed of two ships per day, the future holds a goal of three a day . . . thanks to the efficient use of readily available, familiar methods and materials.



When the rush orders came, many shipbuilders turned at once to the customary riveted and bolted construction they had known and used so long. This standard method of fastening was quickly and easily taught to "green" hands who were pressed into service by the rapid expansion of shipbuilding.

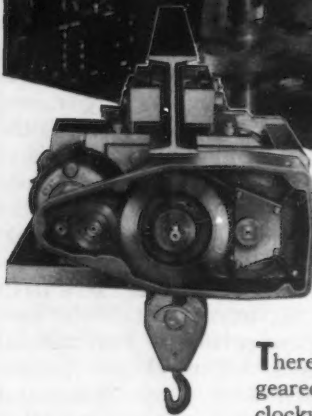
Made to modern accuracy standards and more efficient than ever, Oliver Marine Rivets, even in briefly trained hands, proved a ready match for the speed and dependability demands of the Liberty Ship Program . . . their finless shanks and accurate lengths assured speed and solid fastening. Oliver Commercial Bolts, too, performed hundreds of vital tasks from fitting-up to forming staunch, permanent connections. For special requirements, Oliver High Tensile Bolts, Galvanized Deck Bolts and special purpose fasteners installed quickly on hundreds of vital applications. Boiler room high pressures and high temperatures were met with the extra-dependability of Oliver Alloy Studs.

All these vital tasks, Oliver Steel Fastenings are doing to help assure America's Bridge of Ships . . . these and many more they can do in your industry if it is essential. Here still is latent steel fastener capacity for Victory Industries . . . call on Oliver.



30 R & M HOISTS

Speed this Firm's War Work!



◀ This view (with cover removed) shows the extreme simplicity of the R & M hoisting mechanism. Compact assembly reduces the amount of headroom and gives maximum strength. The entire mechanism can be removed after the cover is taken off.

There are no jams, no wasted time and effort in this war-gear plant! Material and finished products move like clockwork with the help of 30 R & M hoists.

You see three of the newest in action above. They're Cleveland Tramrail mounted 2-ton, all-steel super-production models with pendent, push-button control and a hoisting speed of 20 feet per minute. And spotted in other departments of the plant are 27 more R & M hoists, ranging from half-ton bantams to 5-ton huskies.

R & M hoists have provided the answer for faster material handling in all parts of the country. Their low headroom, ability to handle loads from any angle with perfect balance, and sturdy construction for trouble-free, year-around performance make them first choice for all types of industry.

Get in touch with nearest R & M sales and service office now. Or write the factory direct for complete details. It will pay you to "take it up" with R & M.

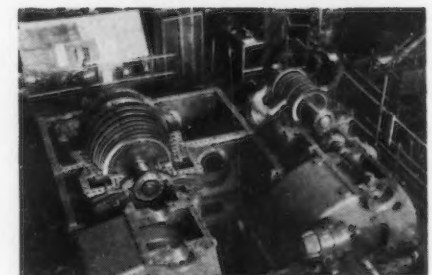
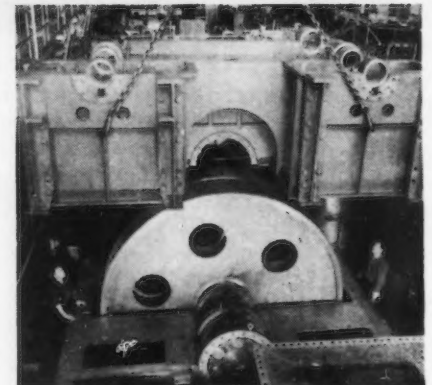
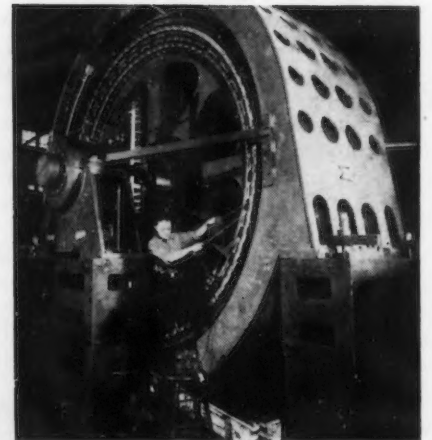
R & M SALES AND SERVICE OFFICES

Albany.....364 Broadway	Cleveland...352 Rockefeller Bldg.	New York.....200 Varick St.
Atlanta.....319 Walton Bldg.	Dallas.....1100 Cadiz St.	Philadelphia...401 N. Broad St.
Baltimore, Lombard & Concord St.	Denver.....1420 16th St.	Pittsburgh....H. W. Oliver Bldg.
Boston.....55 Long Wharf	Detroit.....2921 E. Grand Blvd.	San Francisco...237 Rialto Bldg.
Buffalo.....2005 Delaware Ave.	Houston...3715 Harrisburg Blvd.	Seattle.....216-17 Walker Bldg.
Chicago.....2400 W. Madison St.	Jacksonville...305 Bisbee Bldg.	Syracuse...204 State Tower Bldg.
Cincinnati.....418 New St.	Newark.....700 Bergen St.	
	Montreal...Lyman Tube & Supply Co., Ltd.	

ROBBINS & MYERS • Inc.

HOIST & CRANE DIVISION • SPRINGFIELD, OHIO

MOTORS • FANS • MOYNO PUMPS • FOUNDED 1878



FOR DRIVING THE SHIPS: This propulsion machinery, built by General Electric Co., will be used for driving our merchant and naval ships. In their order from top to bottom, they show: A 6000-hp. motor for an electric-drive ship; welding a gear casing, the fabrication of which reduces the weight from 60 to 35 tons; an intermediate section of a gear casing being lowered to position for a shop test; and a geared-turbine propulsion set being assembled to give it a test run under conditions similar to those aboard ship.

4 U. S. Destroyers Launched in Hour

••• A new world's launching record was established May 3 at Kearny, N. J., when four United States Navy destroyers slid down the ways within an hour at the yard of the Federal Shipbuilding & Dry Dock Co., subsidiary of United States Steel Corp. Another world's record is expected to be established soon when the four fighting ships are scheduled to be completed and delivered to the Navy by the Federal company.

Today's record launchings served to emphasize the outstanding production record of the Federal Shipyard. They brought to 13 the total of ships launched so far this year at the Kearny yard. Nine ships have been delivered this year by the company, and keels have been laid for many more.

Strike at Cuyahoga Plant Ended by SWOC Appeal

Cleveland

••• An outlaw strike, lasting from 3 p.m. to 11 p.m. on April 29 at the American Steel & Wire Co.'s Cuyahoga plant here, ended after William F. Donovan, district director of the SWOC, persuaded the men to return to their jobs. The strike resulted from differences between the company and union representatives in connection with the pay rate for a new operation. The plant is substantially engaged in war work.

The W. J. Schoenberger Co., recent recipient of the Navy "E" flag, was made idle for 24 hours when 350 SWOC valve makers walked out over a labor dispute. Daniel Hurley, U. S. Department of Labor conciliator, blamed the strike on "hot heads," and stated that negotiations for a settlement would continue.

Harvester Agrees to Union Maintenance Clause

Chicago

••• To prevent disturbance of war production, International Harvester Co. has notified the War Labor Board that it will accede to the board's order requiring union maintenance of membership clauses in union contracts, despite the company's pronounced disapproval of the principle involved.



"THIS SHIP WAS NEVER BUILT!"

*The billion and a half man-hours lost last year through work accidents were sufficient to build: 44 battleships, 375 destroyers, 450 submarines, 195,000 light tanks, 75,000 fighter planes or 30,000 medium bombers.
*From figures issued by official sources

HEAT-FAG is Directly Responsible for Many Accidents ... STOP THIS COSTLY TOLL!

THE finger of Accident is always beckoning to the fatigued, inalert worker. That's why Heat-Fag, ever-present when men sweat, takes such a staggering toll in man-hours lost to industry. For, body salt lost by sweating must be replaced or Heat-Fag sets in. Lowered efficiency, fatigue and discomfort follow ... workers become careless ... accidents happen ... priceless man-hours are sacrificed.



QUICK DISSOLVING (less than 30 seconds)

This is how a Morton Salt Tablet looks when magnified. Examine one—see how soft and porous it is inside. When swallowed whole—with a drink of water, they dissolve in less than 30 seconds.

Wherever workers sweat, Salt Tablets are needed, for they represent the simple, easy way to replace salt that's lost through sweating and hot work.

Case of 9000 10-grain salt tablets, **\$2.60**

Salt-Dextrose Tablets, case of 9000 **\$3.15**

Order from your distributor—or directly from this advertisement.

Place MORTON'S DISPENSERS at all Drinking Fountains

They deliver salt tablets, one at a time, quickly, cleanly—without waste. Sanitary, easily filled, durable, 500-tablet size, **\$3.25**. 1000-tablet size **\$4.00**

MORTON SALT CO., Chicago, Ill.

EVERYONE WHO SWEATS NEEDS SALT

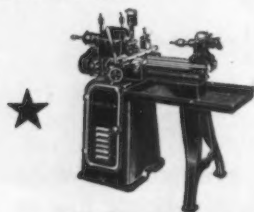


SHELDON Back Geared Screw Cutting PRECISION LATHES



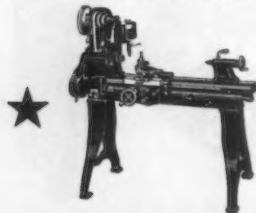
FOR THE TOOL ROOM

The finest 10", 11" and 12" lathes ever built in the moderate price field. Large special analysis steel spindles ground all over, with extra collet capacity. Hand-scraped Bronze, Ultra-Precision Ball or Super-Precision Roller spindle bearings (the finest bearings obtainable). Heavy braced, semi-steel beds with hand-scraped ways (2 V-ways and 2 flat ways). These lathes come with a choice of aprons, gear boxes, and drives including the anti-friction, 4-speed, V-belt Lever-operated pedestal base motor drive illustrated. Telescopic Taper Attachment and other accessories available.



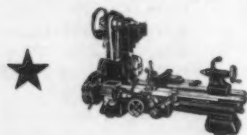
FOR PRODUCTION

Sheldon Lathes will stand up to any production work within their capacity—are ideal for second operation work. Production models available with any or all of these features: Ultra-Precision Ball or Super-Precision Roller spindle bearings, Lever-operated Collet Attachment, Lever-operated Tail Stock, Lever-operated cross slide with double tool post, Lever-operated turret, etc.



FOR MACHINE SHOP

Both Bench and Floor models with choice of Semi-quick or Full-quick Change Gears, Plain Aprons or Worm Feed Apron with Power Cross Feed. Overhead, Back or Underneath Motor Drives — Telescopic Taper Attachments, Tool Post Grinders, Milling attachments and all standard accessories.



Also a full line of Arbor Presses and milling machine Drill Press and Shaper Vises.

Write for Catalog and name of nearest distributor.

SHELDON MACHINE CO., INC.

4240 N. Knox Ave.

Chicago, U.S.A.

NEWS OF INDUSTRY

Sheet & Tube Rejects SWOC Demands "In Public Interest"

Youngstown, Ohio

• • • In a brief submitted to a National War Labor Board panel, the Youngstown Sheet & Tube Co. rejected SWOC demands for a union shop, check off, and a dollar a day increase, and in doing so emphasized that the company has not been requested nor has it consented to submit any matter under discussion between it and the SWOC to arbitration.

According to the company's brief, the company is serving the highest public interest to the nation in time of war by rejecting these demands. The statement continues, "to grant the closed shop would, in our opinion, increase industrial strife, retard the nation's effort toward maximum production, and discriminate against millions of young men in the armed forces when they return to seek employment. To grant the wage increase under present economic conditions would likewise be clearly against the public interest, would greatly aggravate the dangers of uncontrolled inflation, and would create further disparities and inequities between different industries, and between industry and agriculture. In view of the revenue needs of the government for the prosecution of the war, a wage increase of such proportions would likewise be against the public interests in that it would in effect constitute a raid on the treasury of the United States."

New Cast Tin Bronze Specifications Approved

• • • As a further step in conserving the nation's strategic metals, Lessing J. Rosenwald, chief of the Bureau of Industrial Conservation, has announced that new emergency alternate cast tin bronze specifications have been approved by the Committee on Standards of the American Society for Testing Materials.

The new specifications, developed at the suggestion of the Bureau of Industrial Conservation by the Society's copper and copper alloys committee, permit a substantial saving in tin for more vital use in the war effort. The use of secondary metals is emphasized by the specifications, further conserving the vital stockpile.

Greater Tonnage
Per Edge of Blade

A

AMERICAN
SHEAR KNIFE CO.
HOMESTEAD · PENNSYLVANIA

Allison Capacity Will Be Doubled

Indianapolis

• • • At a cost of about \$50,000,000, the capacity for the production of Allison aircraft engines will be practically doubled. A Defense Plant Corp. project, the new plant is expected to be constructed with an absolute minimum of steel with a preference for brick and wood.

260 Machine Tool Dealers Hear George H. Johnson

Cleveland

• • • The machine tool dealer is a production engineer, some 260 dealers assembled here from all over the country were told by George H. Johnson, president, National Machine Tool Builders Association, who added, "his daily work is to help the contractors for America's vast war effort solve the production problems that must be overcome one by one to secure the enormous production required. It is his job to bring to the machine tool builder specific and complete information to enable the latter to do his work with the utmost effectiveness and with the utmost speed. His greatest part in the industry is to be certain that the user of machine tools chooses the right type and the correct number of tools and specifies the proper delivery dates."

"The machine tool industry is rapidly approaching continuous operation," went on Mr. Johnson, who is also president of Gisholt Machine Co. "Many plants are there already. The industry is attempting to solve the problems caused by the scarcity of raw materials and is making every effort to simplify finishes."

Broderick & Bascom Gets E

• • • Broderick & Bascom Rope Co., St. Louis, was awarded the Navy "E" on April 30 by Captain Edwin A. Wolleson, U.S.N., retired, in a ceremony at the plant. J. K. Broderick, president of the company, in accepting the award said that it had not been won by any concerted effort at a production record, but rather that "it was won unknowing and unsought in the regular day by day effort of our men and women."

"LIKE CUTTING
THROUGH BUTTER
... PHILLIPS SCREWS
TAKE THE HARD WORK
OUT OF FASTENING"



"AND DON'T FORGET!
PHILLIPS SCREWS
COST LESS TO USE"

Easier Screwdriving • Freedom from Accidents • Tighter Seating = 50% Less Assembly Cost with Phillips Screws

You'd know the difference if you were doing the job. In fact, executives who have their own home workshops are usually the quickest to see the advantages of the Phillips principle and adopt it for their firm's assembly work.

It really is easy to drive Phillips Recessed Head Screws. You get a better "grab" on the screw because the driver point and Phillips recess make a snug fit. There's no danger of the driver slipping, so you don't have to spend a good part of your effort holding it in — you just keep turning. And there are more jobs on which you can use power drivers.

Translate this ease of driving into time and then time into dollars. An operator can, on the average, cut fastening time in half. Figure it out for yourself — then add the savings you get from using fewer screws (better holding power often reduces number or size of screws needed), spoiling fewer screws (no split screw heads) and eliminating the cost of resurfacing screw-driver scars.

The Phillips Screw is certainly the modern fastening method — which means "better" and "more economical." Any of the firms below can supply you.



PHILLIPS RECESSED HEAD SCREWS

GIVE YOU *2 for 1* (SPEED AT LOWER COST)

WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS
• SCREWS WITH LOCK WASHERS

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
The National Screw & Mfg. Co., Cleveland, Ohio
Whitney Screw Corp., Nashua, N.H.

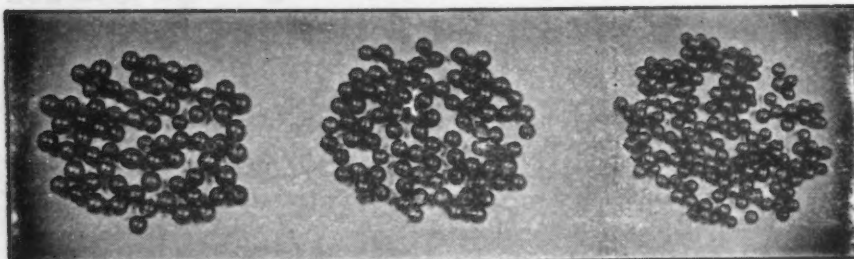
New England Screw Co., Keene, N.H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N.Y.
Pawtucket Screw Co., Pawtucket, R.I.
Phool Manufacturing Co., Chicago, Ill.
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.

LEE
Quality Springs
ALL SHAPES • ALL SIZES • ALL MATERIALS



LEE SPRING COMPANY, Inc.
30 MAIN STREET BROOKLYN, N.Y.

LEE-BUILT
TRADE
MARK
SPRINGS



HEAT-TREATED STEEL SHOT

We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

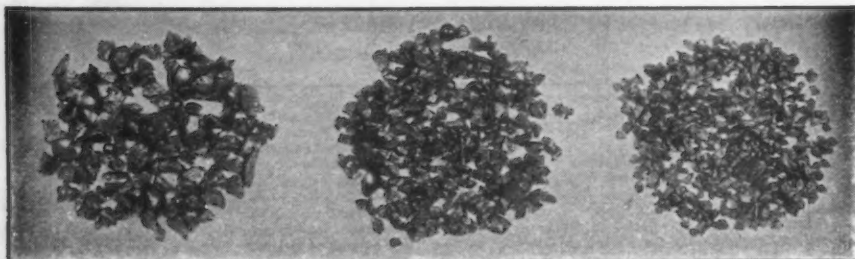
Heat-Treated Steel Shot and Heat-Treated Steel Grit

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

HARRISON ABRASIVE CORPORATION

MANCHESTER, NEW HAMPSHIRE

HEAT-TREATED STEEL GRIT



PRICES

OPA Issues Clarifying

• • • The OPA has issued specific rulings clarifying certain steel extras, all or parts of which had been in doubt as to the proper procedure under Price Schedule No. 6. Generally speaking, actual applications on April 16, 1941, or in some cases on that date and two years prior to that date, have determined the rulings issued by OPA and there have been some cases where changed conditions because of priorities and the production of war material have entered into OPA decisions. A summary of the more important rulings follows:

Quality extras on hot rolled sheets—Most steel company extra books include hot rolled sheet extras which state, "when physical test properties or values are specified or required beyond commercial bend tests, the following extras apply: 12 gage to 7.65 lb. per sq. ft.—under 3/16 in. thick—\$0.15; 13 to 21 gage—\$0.25; 22 gage or lighter—\$0.35. When the seller is required to assume the double hazard of furnishing material to meet: (A.) physical tests; (B.) drawing properties, the following extras apply—12 gage or heavier—\$0.25; 13 to 21 gage—\$0.35; 22 gage or lighter—\$0.45.

The OPA stated that the advent of the continuous sheet mill more or less caused some of these extras to be in disuse prior to April 16, 1941, but admitted that under the present emergency conditions they might in some cases be applicable and made the following ruling:

A. These extras may be charged only on those applications and to those customers where such extras were actually being charged on or prior to April 16, 1941.

B. All other applications where such extras may apply must be specifically approved by OPA before they are charged.

C. The above extras were not published for and were not applicable to cold rolled sheets.

Gun quality, rifle barrel quality, extras, etc.—Prior to April 16, 1941, the extra charge for this quality was \$2.50 a 100 lb. but because of the quantity involved, etc., steel companies had reduced the charge to \$1.50 a 100 lb. The OPA is still studying the problem and pending findings of this study it requests that—

A. A maximum of \$1.50 a 100 lb. is set for the extra on gun quality, rifle barrel quality, etc.

B. This charge shall only be

PRICES

New Rulings Steel Extras

made where such quality is specified, requested and furnished.

Deep drawing extra on hot rolled strip—steel company extra books show a drawing quality extra on 0.105-in. or heavier at 15c. a 100 lb. and 0.104-in. or lighter at 25c. a 100 lb. These lists further state that "drawing quality extras also apply whenever hot rolled strip, carbon 0.30 per cent or under, is specified to be normalized for box annealed." It was said that these extras were only charged prior to April 16, 1941, when it was necessary to normalize or box anneal in order to fabricate the steel. Accordingly, the OPA ruled that—

The drawing quality extra listed above may be charged only when hot rolled strip, carbon 0.30 per cent or under, is actually normalized or box annealed.

This apparently refers to or clarifies the above paragraph wherein the words "is specified" are used and makes sure that actual normalizing or box annealing takes place.

Cold heading extras for SAE 1030, 1035, 1040 rods for bolt making applications—steel extra books carry a special cold heading quality for "extra restrictive requirements on check analysis, metallographic examinations, deep acid etch tests, McQuaid-Ehn test, guaranteed results on heat treatments, etc., of 50c. a 100 lb." The OPA has stated that this extra had been customarily disregarded by most producers prior to April 16, 1941, because of the competitive situation on the manufacture of bolts and cap screws for certain automotive applications.

It was further said, however, that bolts made from this type of steel and to the same general specifications are now being applied on direct and indirect war materials. This meant, the OPA said, that companies which did not compete for this business prior to April 16, 1941, now have to accept such orders because of priorities, etc. Accordingly, the OPA allowed the following: The extra for "special cold heading quality" as listed above for applications described above is applicable where such quality is specified by the purchaser or is actually required in order to meet the requirements of the product being fabricated.

Switching of extras—the OPA has stated that an attempt has been made by some companies to apply a published extra of one product to a product of similar nature and accordingly has ruled that mills may not apply the published extra on one product to a kindred product for which that extra is not published unless it was actually followed prior to April 16, 1941, in which case such extra for such product must be filed with OPA.

Extra on electric furnace quality—The OPA has ruled that electric furnace differential may be charged only for such application where the additional quality which may be produced by the electric furnace process is actually required and is provided in order to fabricate successfully the product in question or meet the specifications of the purchaser.

Quantity discounts or extras—The OPA has said that since mills are no longer free agents in distribution of their products, there will be many times where only a portion of an order may be shipped and clarification has been asked by the steel industry on these extras. The OPA has ruled that:

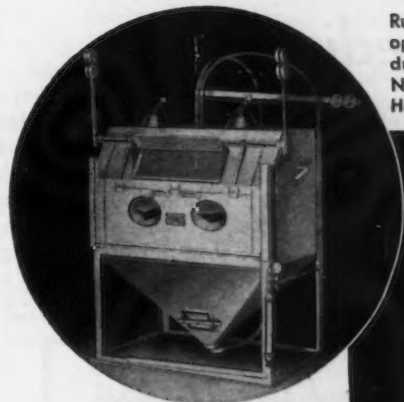
A. If the mill ships quantities of an item in accordance with customers releases, the usual or customary rules shall be used to determine the quantity discounts or extras.

B. If the mill ships quantities of one item which are less than the amount released by the customer and such lesser amount was necessitated solely and directly by restrictions imposed by priority regulations of WPB, the amount of the item shipped to one destination at one time shall determine the proper quantity discount or extra.

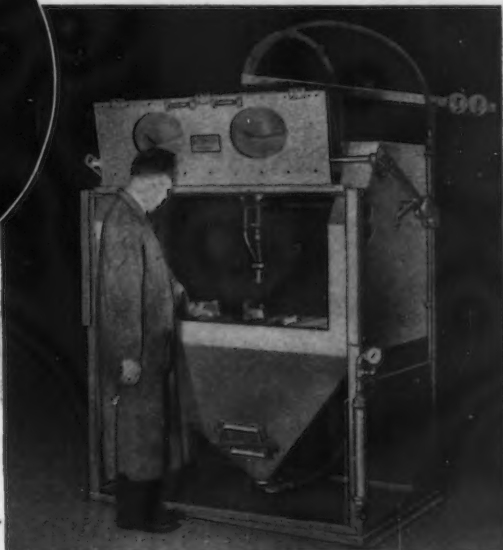
C. If less than the amount released by

(Concluded on page 166)

SAND BLASTING Made Easy for Defense Production!



Ruemelin Sand Blast Cabinets put blast cleaning operations on a faster, more efficient basis. Eliminate dust, permitting installation anywhere in the plant. No skilled labor required. Sturdily constructed. Handles sand or steel abrasives. Prompt delivery.



RECOMMENDED FOR:

1. Heat treating plant—removing scale, oxides.
2. Aircraft production—cleaning welds, metal preparation.
3. Foundries, ferrous and non-ferrous—cleaning castings.

RUEMELIN MANUFACTURING CO.
3960 N. Palmer St • Milwaukee, Wis.

Ruemelin cabinet with door open. Provides quick access for loading and unloading.

RUEMELIN Blast Cleaning Cabinets

"Production Increased"
"Better Welds Produced"
"Time Saved"
"Costs Cut"



An article for one of our Armed Forces being position-welded on a Ransome Positioner.

There are oft-repeated statements of users of Ransome Positioners.

Today, when saving time is vital, when production is the first consideration, Ransome Positioners are a necessity where any manner of shapes and forms are welded.

Ransome is prepared to study your welding problems with a view to bettering your production and cutting your costs. Write for full information.

INDUSTRIAL DIVISION

RANSOME CONCRETE MACHINERY COMPANY

Dunellen

New Jersey

Analysis of Steel Prices and Costs by OPA Predicted

••• Just what action OPA intends to take on the steel price structure in the future remains in doubt but it is known this agency has asked several companies for cost data on steel prices and the industry appears concerned. Rum-

ors have been circulating that reductions in the overall steel price structure may amount to as much as 5 per cent. Reductions made so far have affected only one item, bale ties, and this action is being protested by some companies.

So far only one increase has been granted on an industry-wide basis, that of wire cloth. Other approved price increases have been for specific products involving specific companies, all of which have been smaller units that substantiated increased manufacturing costs.

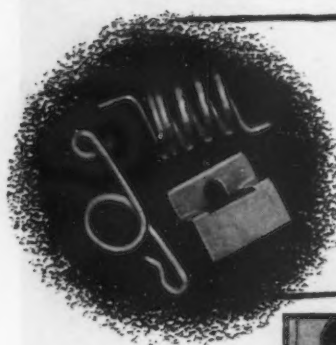
Informed sources believe that OPA will, as soon as it can get around to it, make an exhaustive check on price data for the industry with a view toward attempting to balance out any logical increases with reductions on other products that seem, in the opinion of OPA, to be out of line from the profit standpoint.

OPA probably will look upon the whole price situation with an eye to overall steel company earnings, before taxes. The policy that permitted upward adjustments for smaller units could not be applied to large steel companies. An approved increase on a product of a large company, even if substantiated by data, etc., would be no more than a permission to charge such a price since competitive conditions in the industry would almost require that this company meet the general price in the trade. For that reason most observers believe that any price adjustments in the steel industry would have to be on an industry-wide basis.

The problem of steel pricing is so complex that OPA is not expected to present any rulings for some time. Eventually OPA might exact certain price changes in some products before allowing an increase in others so that the overall picture might change but little and might, as suggested in some quarters, result in an overall reduction.

The injection of steel price reports at this time might also be some kind of a trial balloon or offset in case the WLB recommends a wage increase in the steel industry. OPA head Henderson has been against a wage increase in steel because of the pressure that would ensue for higher prices.

••• Leon Henderson in Washington, Friday, stated that both he and President Roosevelt haven't been worried over steel industry prices and are "tremendously pleased with steel price ceilings." He declined to comment on the WLB's expected increase in steel



Parts Like These

- Manufactured to users' specifications
- Produced for specific applications
- Made in all kinds of metals and alloys

Let us know what you want to accomplish; we will help to solve your problem.

SPRINGS

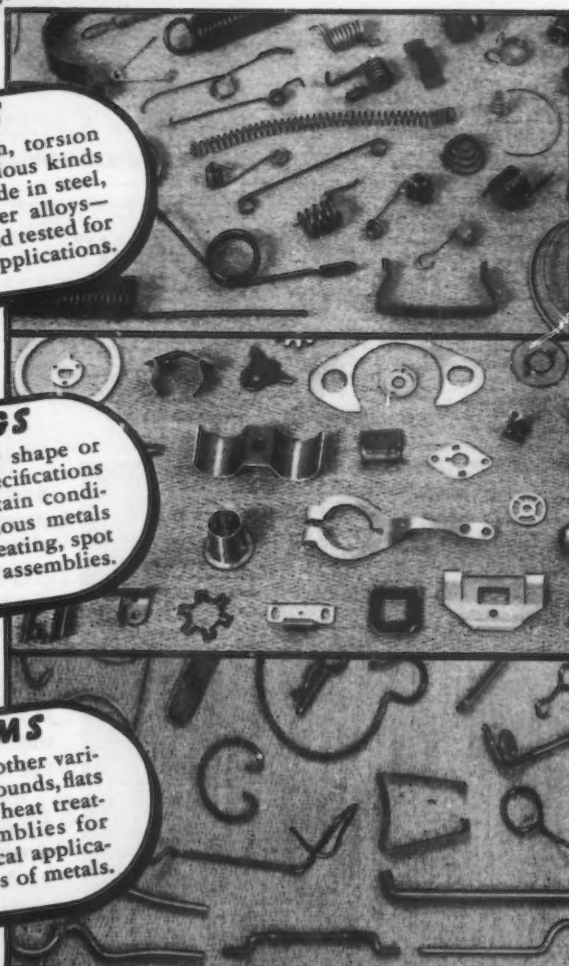
Compression, extension, torsion and flat types, with various kinds of ends and loops—made in steel, brass, bronze and other alloys—formed, heat treated and tested for specific functions and applications.

STAMPINGS

Small stampings of any shape or form made to users' specifications or developed to fit certain conditions—made from various metals and alloys; also heat treating, spot welding and tapped assemblies.

WIRE FORMS

Pins, clips, cotters and other various, intricate shapes in rounds, flats and squares including heat treating and welded assemblies for every kind of mechanical application; and from all types of metals.



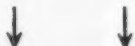
M-D-HUBBARD SPRING CO.

331 CENTRAL AVE. • PONTIAC, MICH.



industry wages, but pointed out that OPA experts last year guessed correctly as to the effect on profits of the 10-cent wage increase which was put through.

One factor bearing on the current situation is believed to be the pressure of governmental buying agencies (the government being the greatest buyer of steel today) for lower costs in the renegotiation of government contracts.



• • • It is understood on good authority that many steel companies are availing themselves of the right to petition OPA for the formation of an industry advisory committee for the iron and steel industry in the carrying out of price policies in the OPA as contained in the Emergency Price Control Act, Section 2a. It is believed that many companies in the steel industry have asked OPA that such a committee be formed.



Adjustment Boards Formed

Washington

• • • Hitting at excessive war profits, the War Department last Thursday announced that price adjustment boards had been formed in both the War and Navy Departments to review and renegotiate contracts where the margin of profit is found to exceed the cost of production too greatly.

The boards will work in close cooperation with the purchase branch, procurement and distribution division, headquarters, services of supply, and with all supply arms and services, the Office of Procurement and Material, U. S. Navy, and the WPB cost analysis section.



Machinery Ceiling Set

• • • Sales, rentals, machine work and parts of machines have been placed under maximum price regulation by OPA at levels prevailing Oct. 1, 1941. The regulation, Price Schedule 136, effective May 18, also covers transactions in used machinery.

Excluded are any sale, lease, delivery or machine work for which

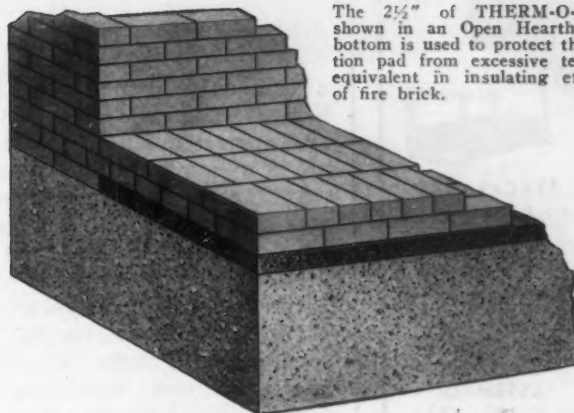
a maximum price is already established by OPA; any sale or delivery of a new machine or part for which the maker had no established price Oct. 1, 1941, and which is made pursuant to order for incorporation in a product manufactured by the buyer, except that no machine or part listed in Appendix A of the order can be excluded; any sale at retail of a machine or part made at a store,

shop, or other similar place of business at which retail sales are customarily made.

Sellers and lessors subject to the new order must file with OPA before July 1 all prices and rentals in effect Oct. 1, 1941, for machines and parts; and processors must file all established charges in effect on the same date. On new machines and parts full data must be filed with OPA. The

Therm-O-flake INSULATING CONCRETE

A Light Weight High Temperature Concrete with
Double Insulating Value



The 2½" of THERM-O-FLAKE Concrete shown in an Open Hearth checker chamber bottom is used to protect the concrete foundation pad from excessive temperatures. It is equivalent in insulating effect to about 15" of fire brick.

Reduces usual insulating concrete thickness by about half.

Increases effective depths of flues and checkers in Open Hearth furnace construction.

Protects concrete foundation pads from excessive heat.

Allows increased magnesite thickness in Open Hearth bottoms.

Smooths surface irregularities on Open Hearth bottom pans.



Write for Information and Prices

other **Therm-O-flake** Products

Made from Exfoliated Vermiculite

Granules - Coating - Brick - Block



JOLIET, ILL.

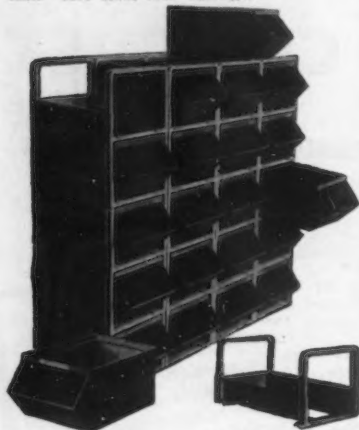
Is Slow Handling of Parts "Choking" Production?

Here's how the Stackbin System—made up of inexpensive, portable storage units—will speed up handling of parts and materials.

No stockroom tie-up! Parts can be located instantly without piling and unpiling boxes. Can be transferred from bin to tote pan and back again without a minute's loss. *No waste motions on assembly line!* Parts can be placed within easy reach of workers. Units can be erected under benches, near machines. The Stackbin System is speeding up handling of parts in aircraft plants—in most production-minded industries. Write for "LOWER COST STORAGE AND HANDLING". Stackbin Corp., 89 Troy St., Providence, R. I.

IDEAL STOCKROOM UNIT

is this combination of Stackbins-in-Stack-racks. Parts and materials are transferred from one department to another, are used or processed and passed along in their storage container. No waste time—less loss, less damage.



STACKBINS

are individual hopper-fronted storage bins—with perfectly smooth interiors—which nest to form work units and slide in Stackracks like drawers for storage.

STACKRACKS

are individual racks of heavy steel—made in any size you need. Locking together without tools, they make a strong, rigid storage rack of any capacity, height or shape you want.

AS FLEXIBLE, EASY TO ASSEMBLE

as sectional book-cases, nested Stackbin sections provide temporary storage space wherever needed. Many modern plants use them as room or departmental storage "depots".



SLOPING FLOORS

permit Stackbin Assembly Bins to feed parts continuously towards the front of the bin. Tapered front design provides semi-circular set-up, so that all parts are within easy reach.

All units in the Stackbin System are constructed of heavy steel—welded for permanent rigidity.

STACKBIN

STACKED
AND



STILL
ACCESSIBLE

SYSTEM

STACKBIN CORPORATION
89 Troy St., Providence, R. I.

PRICES

order also lists action to be followed in other eventualities.

Maximum prices are established as follows:

Sales of new machines and parts by the manufacturer.

(1) If for any new machine or part the manufacturer thereof had an established price in effect on Oct. 1, 1941, such price shall be the maximum price.

(2) If for any new machine or part the manufacturer thereof had no established price in effect on Oct. 1, 1941, the maximum price shall be the net price determined on the basis of labor rates, material prices, and overhead rates in effect on Oct. 1, 1941, and by the use of the price-determining method which would have been used on that date.

(3) If a net price of a new machine or part determined in accordance with paragraph above is filed and not disapproved by OPA within 30 days after receipt, such net price shall be the maximum price applicable to all subsequent sales and deliveries of such machine or part.

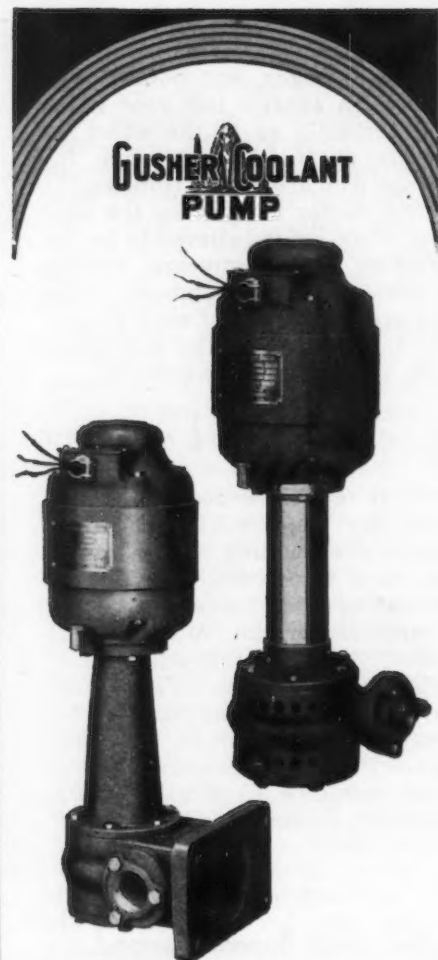
(4) If the manufacture of a new machine or part requires the use of materials whose Oct. 1, 1941, prices are not ascertainable, or if a new machine or part is manufactured in a new plant, the maximum price of such machine or part shall be the net price filed and not disapproved by OPA within 30 days after receipt.

(5) Notwithstanding the provisions of paragraphs (1), (2), (3), and (4) above, maximum prices for the companies and for the machines and parts set forth in Administrative Notice No. 1, shall, pursuant to previous review by OPA be the prices listed therein.

Sales of New Machines and parts by a seller other than the manufacturer.

(1) If for any new machine or part a seller other than the manufacturer had an established price in effect on Oct. 1, 1941, such price shall be the maximum price.

(2) If for any new machine or part such seller had no established price in effect Oct. 1, 1941, the maximum price shall be the net price determined by applying to the seller's net invoiced cost of such machine or part, the percentage margin over net invoiced cost realized on or about Oct. 1, 1941, for the nearest equivalent new



KEEP your Machine Tools YOUNG!

Don't let the steady flow of defense work in your plant be tied up by a tardy machine tool. Insure the satisfactory and continuous functioning of your machines by using Ruthman Gusher Coolant Pumps.

They really do a good job—so much so that they are now standard equipment on many well-known machine tools. Therefore specify Ruthman Coolant Pumps—the pumps that keep your cutting tools young.

The
RUTHMAN
Machinery Company
CINCINNATI, OHIO, U.S.A.
1821 Reading Road

PRICES

Items Excluded from General Price Order

• • • Excluded from the provisions of the General Maximum Price Regulation are the following:

1. All waste materials up to the level of the industrial consumer.
2. Zinc, lead and tin industrial residues.
3. Certain machines and parts made in the course of subcontracting including certain machines and parts designed for war production use; also services performed on materials furnished by the customer, which will result in such machines.
4. Antimony ore and concentrates.
5. Instrument jewel bearings.

The above exemptions are covered in Supplemental Regulation No. 1 which becomes effective May 11.

machine or part sold by such seller on or about Oct. 1, 1941.

(3) If for any new machine or part such seller had no established price in effect Oct. 1, 1941, and if such seller sold no near equivalent new machine or part on or about that date, the maximum price shall be the net price filed and not disapproved by OPA within 30 days after receipt.

Sales of second-hand machines and parts.

(1) The maximum price for a rebuilt and guaranteed machine or part shall be 85 per cent of the net price in effect on Oct. 1, 1941, for the nearest equivalent new machine or part.

(2) The maximum price for any other second-hand machine or part shall be 55 per cent of the net price in effect on Oct. 1, 1941, for the nearest equivalent new machine or part.

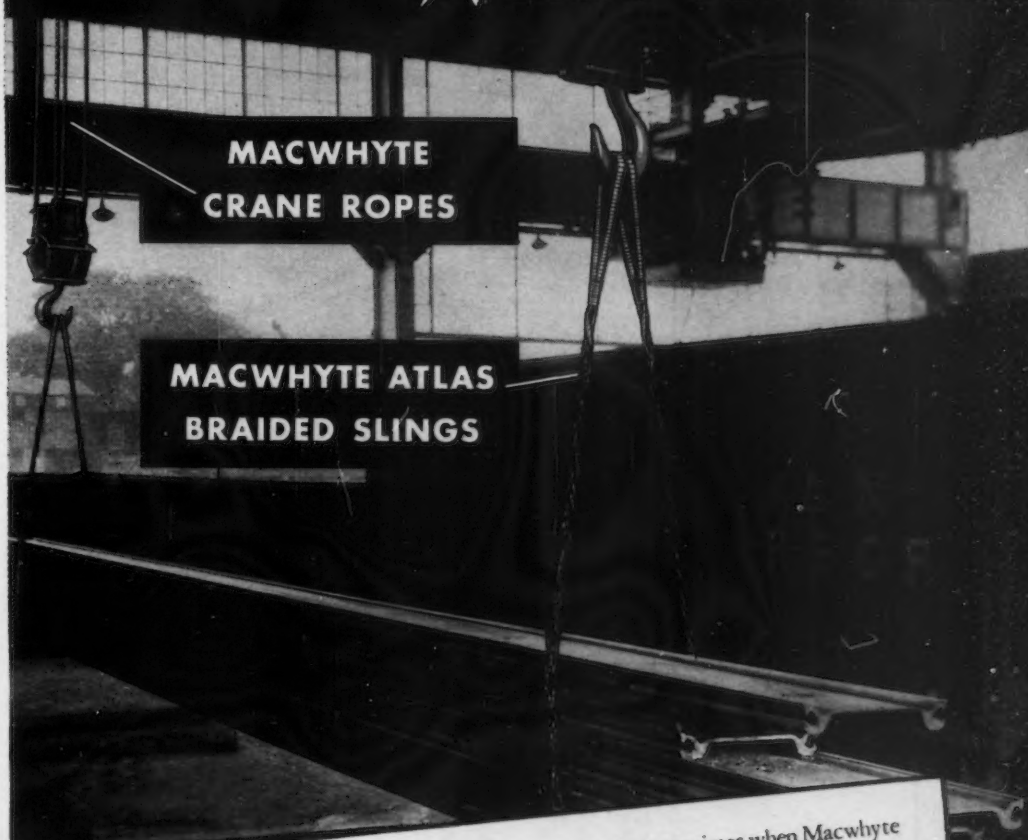
Rentals.

(1) If for any machine or part the lessor thereof had an established rental in effect Oct. 1, 1941, such rental shall be the maximum rental.

(2) If for any machine or part the lessor thereof had no established rental in effect on Oct. 1, 1941, the maximum rental shall be the net rental which would have been determined on Oct. 1, 1941.

(3) If the net rental of a machine or part determined in accordance with paragraph (2)

Now ²⁴ working ~~8~~ HOURS PER DAY
~~7~~ DAYS PER WEEK



Perhaps you've wondered where you can go for crane ropes which give the continuous, safe service demanded now?

The answer isn't difficult to find. Try Macwhyte's MONARCH Whyte Strand PREformed Crane Ropes. They're strong, tough, and tireless. They've proved their safety. They resist wear and fatigue. They're especially made for today's tough job. AND they're doing that job 24 hours a day, 7 days a week in MANY a plant.

Why are MONARCH Whyte Strand Crane Ropes so efficient, safe? There are many reasons. Here, specifically, are two:

Outer wires of each strand are made with maximum flexibility and toughness to defend them against bending fatigue and abrasive wear.

Inner wires of each strand are the reserve strength of the rope, have maximum tensile strength. This prevents normal wear on outside wires from breaking rope prematurely.

Tell us the make, model, and capacity of your crane... and we'll supply the correct rope for it: Monarch PREformed.

Times like these are times when Macwhyte Atlas Braided Slings are most valuable. For they s-p-e-e-d your loads SAFELY day and night.

Macwhyte Atlas Slings are braided from both left-&-right lay endless wire ropes. This unique construction (see illustration) gives them:

1. Perfect balance that eliminates spinning.
2. Extreme flexibility; they handle like a silken rope; resist kinking.
3. No splices to wicker and injure hands.
4. Positive safety of endless wire ropes.

Today American industry is using Macwhyte Atlas Slings to handle pipes, shapes, tanks, bars, armaments, machinery, rolls, etc. These slings can help YOU step up production SAFELY.

We'll be glad to send you helpful rigging bulletins; simply write on your company letterhead.

CRANE ROPES to hoist the load . . .
BRAIDED SLINGS to harness it safely. **BUY BOTH FROM**

MACWHYTE COMPANY

2911 Fourteenth Avenue, Kenosha, Wisconsin — Manufacturers of wire rope to meet every need —
Left- &-Right Lay Braided Slings — Stainless Steel Wire Rope — Monel Metal Wire Rope — Aircraft
Cable, Aircraft Tie-Rods, "Safe-Lock" Swaged Terminals.
New York Pittsburgh Chicago Ft. Worth San Francisco Portland Seattle: Distributors throughout U.S.A.

above is filed and not disapproved by the OPA within 30 days after receipt, such net rental shall be the maximum rental applicable to all subsequent leases of such machine or part.

Machine Work

(1) If for any machine work a processor had an established charge in effect on Oct. 1, 1941, such charge shall be the maximum charge.

(2) If for any machine work a processor had no established charge in effect on Oct. 1, 1941, the maximum charge shall be the net charge which would have been determined on Oct. 1, 1941, on the basis of labor rates and machine-hour rates in effect on that date.

(3) If the net charge for any machine work determined in accordance with paragraph (2) above is filed and not disapproved

by the OPA within 30 days after receipt, such net charge shall thereafter be the maximum charge for all such machine work.

Price adjustment. No person shall enter into any agreement or arrangement for the sale or delivery of any machine or part which provides for upward adjustment of the price or which permits delivery at a price which may be above the maximum price established by this Maximum Price Regulation No. 136 and in effect on the date of acceptance of the order for such machine or part, except that any agreement may contain a provision for price adjustment to be applied only to those deliveries made more than nine months after such agreement is entered into if the agreement also contains a provision that the final prices after all adjustments shall in no case exceed the applicable maximum prices established by the OPA and in effect on the dates of delivery.



Our All-Out War Effort

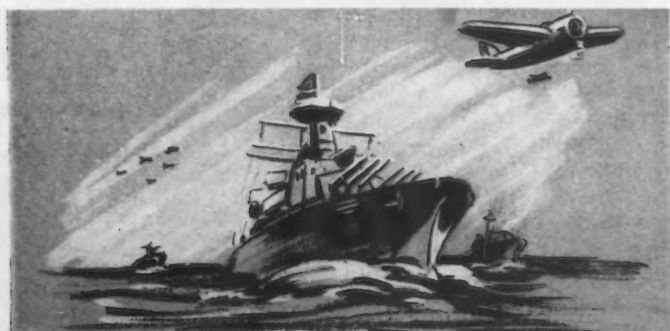
calls for top-speed production without frequent interruptions for re-packing and for replacing gaskets.

The dependability of all Garlock products is helping industry maintain Vital, non-stop, smooth-running production.

THE GARLOCK PACKING CO., PALMYRA, NEW YORK
In Canada: The Garlock Packing Co. of Canada Ltd., Montreal, Que.



GARLOCK



Ferromanganese at \$135

•••The maximum price for standard ferromanganese containing 78-82 per cent manganese becomes \$135 per gross ton for bulk shipments in carload lots, f.o.b. Atlantic seaboard, effective May 1, under Schedule 138. The price has been \$120.

For Tennessee Products Corp. the maximum prices are f.o.b. Rockdale or Rockwood, Tenn., and for Sloss-Sheffield Steel & Iron Co., f.o.b. Birmingham.

Standard ferromanganese is defined as having: manganese 75-85 per cent; silicon 1.25 per cent maximum; phosphorus 0.50 per cent max.; carbon 7.50 per cent max.; and sulphur 0.05 per cent max.

The schedule is as follows:

(Bulk shipments in carload lots)		Kind or Grade	
Per Cent Mn		Maximum Price Per Gross Ton	
78-82	.....	\$135.00	
75-78	.....	\$135.00 less \$1.70	
		for each 1% of Mn	
		below 78%	
82-85	.....	\$135.00 plus \$1.70	
		for each 1% of Mn	
		over 82%	

For shipments other than bulk shipments in carload lots, the fol-

PRICES

lowing maximum premiums may be added:

	(Per Gross Ton)
Packed carload lots.....	\$6
Gross ton lots packed.....	\$10
Less than gross ton lots	
(i) Packed down to 200 lbs.	\$13.50
(ii) Less than 200 lb.	\$18.00
Crushed to specified mesh...	Normal premium prevailing on April 28, 1942.

The maximum prices set forth above shall not be increased by any charges for the extension of credit and shall be reduced by ½ of 1 per cent for payment within 10 days of delivery.

Delivered Prices Raised

• • • Delivered prices of iron and steel products applicable to Toledo, Detroit, Eastern Michigan and Gulf Coast basing points are higher under Amendment No. 4 to Revised Price Schedule 6, issued April 28. On ingots, blooms, billets and slabs an increase of 25c. per gross ton has been permitted, and on all other iron and steel products 2c. per hundred pounds is permitted. The increase in delivery to these points reflects the 6 per cent increase in rail rates. The advances are applicable to carload and less-than-carload shipments.

MRC Nickel Purchases

• • • Purchases by Metals Reserve Co. of stocks of metallic nickel frozen by the nickel conservation order M-6-b, in accordance with the program announced by WPB, April 15, will be excepted from provisions of the nickel scrap price schedule, OPA announced May 1. This ruling is made in Amendment No. 2, effective as of April 15, to Revised Price Schedule No. 8.

More Coke Prices Set

Washington

• • • The maximum prices which may be charged after May 18 for coke, including low temperature and petroleum coke, except by-product foundry, blast furnace, and beehive coke produced in Pennsylvania, were set by OPA on April 30 at levels prevailing Dec. 15-31, 1941. Other fuels whose maximum prices were similarly fixed by the order, Maximum Price

Regulation No. 121, include: anthracite other than Pennsylvania anthracite; semi-anthracite; coal and coke briquettes; and sea coal used for foundry facings.

The order stipulates that the producer shall allow deductions of cash and quantity discounts permitted during the base period. Rates of interest on delinquent accounts, notes or other evidence of indebtedness shall not be higher, nor shall special service charges be higher, than those charged during the same period.

Sales at prices lower than the maximums are permitted and contracts are permitted setting prices at maximum at the time of delivery. If products are in transit in cars not owned by the producer before May 18, the maximum prices do not apply.

Bolt and Nut Ceiling Soon

• • • It is understood that the OPA price ceiling on nuts, bolts,



IN THE process of manufacturing these many, many engines of war, there are countless parts that must be cleaned after machining, grinding, lapping, plating, heat treating, etc., to insure proper performance.

• For cleaning pistons, crankshafts, camshafts . . . projectiles, cartridge cases, bombs . . . bomb fins and fin assemblies . . . for every conceivable metal-cleaning purpose, and for use in all types of equipment, there is a specialized Wyandotte Degreasing Compound.

• And Wyandotte Field Engineers are always ready to assist with your cleaning problems.



Wyandotte
PRODUCTS
SERVICE REPRESENTATIVES IN 98 CITIES

THE J. B. FORD SALES COMPANY • WYANDOTTE, MICHIGAN

and rivets, expected since Nov. 1, soon will be released, with prices frozen as of Aug. 1. This may mean some reduction in prices for cap and set screws. Manufacturers apparently have anticipated the issuance of the ceiling, and are offering larger discounts from list prices than is the general practice of the industry.

Strong competition is going on among some secondary producers

for A-1-a rated business, in order to assure the recipients of a good enough rating to secure material deliveries. Observers report that some very substantial price concessions have been made by smaller companies. Meanwhile, deliveries to jobbers have been steadily declining since many new war plants and many large orders placed by munitions manufacturers holding A-1-a ratings have

been taking a larger and larger share of total shipments.



Bituminous Coal Prices

• • • Maximum prices for bituminous coal sold at mines or preparation plants are set in Schedule No. 120, effective May 18, in 22 production districts. The regulation provides that when Coal Division minimum prices for any special movement are higher than the OPA maximum, the particular shipment may be made at the applicable minimum. All designations of classifications, price groups, size groups, market areas, etc., are the same designations as in schedules for the same districts established by the Coal Division. Mixtures of two or more sizes must be sold at not more than the weighted average of maximum prices for each size on a net ton basis. Fuel delivered in transportation facilities owned, controlled or hired by producer, distributor or subsidiary, may be priced to include actual transportation costs if they do not exceed lowest common carrier rate for the same haul.



Imported Scrap

• • • Imported nickel-bearing steel scrap and secondary materials must be sold at no more than the maximum prices provided for domestic scrap, according to Amendment No. 1 to Revised Price Schedule 8, effective April 28. In the past, import charges under the law could be passed on to the ultimate consumer. Congress recently removed tariff duties from non-ferrous iron and steel scrap. OPA permission no longer need be obtained before remaining import charges are passed along to the buyer. The seller only has to file a report after the transaction has been completed, indicating the schedule has not been violated.



Fluorspar Prices at Levels In Effect on Jan. 2

• • • Prices established in Schedule 126 for fluorspar are those in effect for individual producers on Jan. 2, 1942. The formal schedule was issued April 30 and becomes effective May 11. It replaces the

They call it 'CULLET'

BROKEN bottles to the layman—cullet to the glass manufacturers. This scrap glass is segregated according to color, washed, uniformly broken and shipped to the glass factories, where it is introduced into the glass batches to produce a better, cheaper product.

Essential to the successful use of cullet is the removal of all iron which would discolor or spoil the new glass, a job ably performed by Dings Magnetic Separators.

This is just one of thousands of applications of separation to lower costs, speed work and produce better results.

For the mining field it's Dings Separators for separation, concentration, crusher protection and laboratory work.

Write today for the Magnetic Mineralogy Bulletin describing the latest equipment for these jobs.

Separation headquarters since 1899.

DINGS MAGNETIC SEPARATOR CO., 516 E. Smith St., Milwaukee

Dings
MAGNETIC
SEPARATION

Temporary Ceilings Void upon May 18

••• On and after May 18, the temporary maximum price regulations listed below, which established temporarily the maximum prices for sales and deliveries of the commodities designated, are ineffective:

Temp. No.	Title	Sections (Incl.)
12	Domestic washing machines and ironing machines — distributors and retailers	1380.151 to 1380.161
13	Resale of new domestic cooking and heating stoves and ranges	1356.21 to 1356.31
14	Resale of new radio receiving sets and phonographs — distributors and retailers	1336.151 to 1336.161
15	New typewriters	1398.1 to 1398.11
17	Plumbing fixtures	1409.1 to 1409.10
18	Domestic electrical appliances	1370.51 to 1370.62
19	Oil paints and varnish	1403.1 to 1403.10

informal ceiling prevailing since Jan. 20.

OPA says that on Jan. 2 prices in the Kentucky-Illinois area for fluxing or metallurgical grade generally varied between \$23 and \$25 per ton f.o.b. Marion, Ky., or Re-siclars, Ill. Acid grade prices were about \$6 to \$8 higher, OPA said.

The schedule provides that maximum prices are:

"(1) The highest price which the producer making the sale or delivery, had in effect for that grade of fluorspar on Jan. 2, 1942, f.o.b. the railroad or waterway shipping point from which such producer customarily ships from the mine or mill from which the sale or delivery is made: *Provided, however,* that if such Jan. 2, 1942, price was on a basis other than f.o.b. such shipping point, such price shall be adjusted in such manner by the addition or deduction of shipping costs as to be converted into a price f.o.b. such shipping point;

"(2) In case the producer had no such price in effect on Jan. 2, 1942, the highest price for fluorspar of that grade in effect on that day in the case of the most closely competitive seller of the same class in the same competitive area;

"(3) If the producer claims that a maximum price cannot be determined under (1) and (2) of this paragraph then a price determined by the OPA to be in line with the level of maximum prices established by this section. This price will be determined by said office upon written application to the OPA, by any producer, setting forth the location of his mine or mill from which the fluorspar is to be shipped, and the grade or grades of fluorspar for which prices are desired. In making the determination, consideration will be given to the geographical location of the mine or mill, and to freight differentials between that location and the location of other mines or mills, in shipments to points at which fluorspar is consumed."

Construction Equipment

••• A new order setting back rising rental prices for construction

and road maintenance equipment to the levels of over seven months ago was announced April 28 by Price Administrator Henderson.

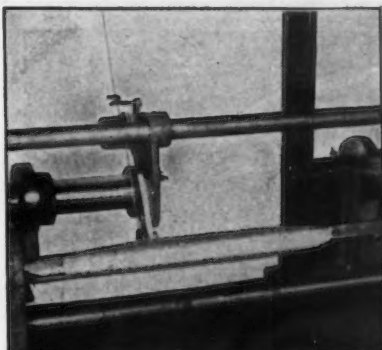
Beginning May 11, regardless of any contract, agreement, lease or other obligation, no person can lease any construction or road maintenance equipment at rental prices or rates in excess of a schedule based upon rentals prevailing between Oct. 1 and 15, 1941. The schedule appears in

new Maximum Price Regulation No. 134.

Non-Ferrous Castings

••• Maximum Price Regulation 125 effective May 11, establishes ceilings on non-ferrous foundry products on the following basis:

(a) Castings substantially the



FIDELITY Quill Winder..

Accurate Taper Winding of Wire
for Weaving of Wire Cloth for
FILTERS · SCREENS · SIFTERS, etc.

The FIDELITY Quill Winder for accurate, high-speed taper winding of wire—six packages of uniformly even lay and taper at one time—speeds production for manufacturers of wire cloth for filters, screens, sifters, etc.

The taper is automatically governed by control buttons which reverse and successively shorten the traverse in the same operation.

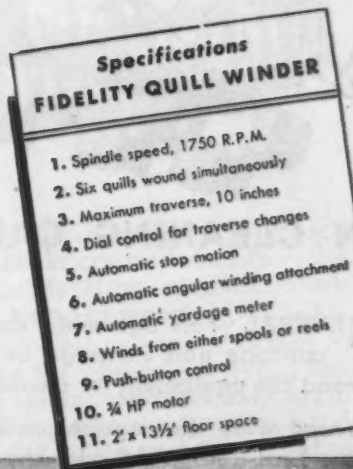
Slow acceleration prevents wire stretching and breakage. Other outstanding advantages include: hydraulic control, individual motor drive, tension control on feeder, and automatic stop motion and yardage meter.

You can wind wire from spools or brake-controlled reels depending on your requirements.

For further information and details, write to

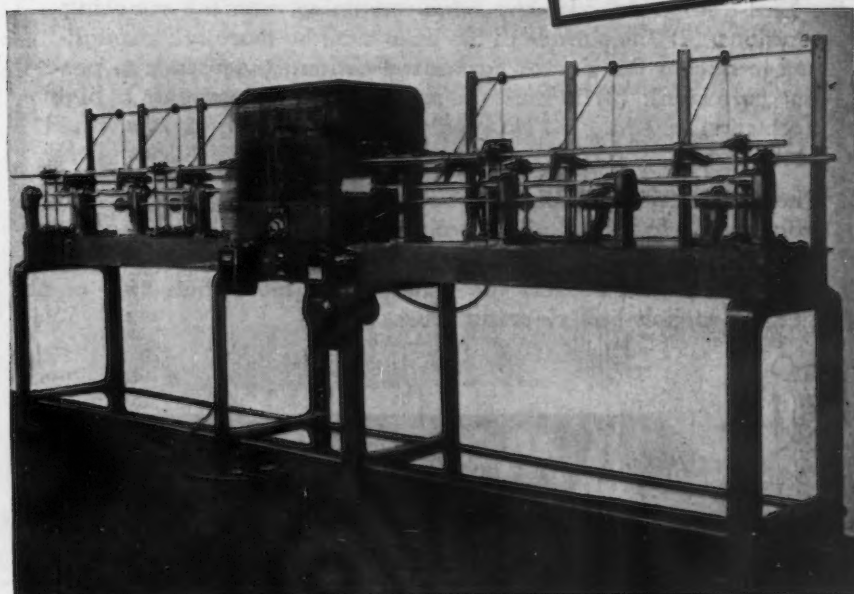
FIDELITY MACHINE COMPANY

3908-18 Frankford Avenue, Philadelphia, Pa.



Specifications FIDELITY QUILL WINDER

1. Spindle speed, 1750 R.P.M.
2. Six quills wound simultaneously
3. Maximum traverse, 10 inches
4. Dial control for traverse changes
5. Automatic stop motion
6. Automatic angular winding attachment
7. Automatic yardage meter
8. Winds from either spools or reels
9. Push-button control
10. ¼ HP motor
11. 2' x 13½' floor space



same as those sold or contracted to be sold during the period from Oct. 1 to Oct. 15, 1941, inclusive: The applicable maximum price for such castings shall be the highest net price (after adjustment for all applicable extra charges, discounts or other allowances) at which the seller sold or contracted to sell such castings to a purchaser of the same class during the period from Oct. 1 to Oct. 15, 1941, inclusive.

(b) Castings substantially dif-

ferent from those sold or contracted to be sold during the period from Oct. 1 to Oct. 15, 1941, inclusive: The applicable maximum price for such castings shall be a net price (after adjustments for all other allowances) not in excess of that at which the seller would have sold such castings to a purchaser of the same class on Oct. 15, 1941, under the pricing formula or method of calculating price used by the seller on Oct. 15, 1941, employing the

same cost factors (wage rates, price of materials and overhead) and profit margins which the seller would have used on Oct. 15, 1941, even though the seller's costs or profit margins may have increased since that date.

Non-ferrous castings are defined as all castings made in sand, semi-permanent or permanent molds poured at atmospheric pressure from aluminum, antimony, bismuth, cadmium, cobalt, copper, lead, magnesium, nickel, beryllium, tin, zinc, and their alloys where any one or any combination of the above metals equals or exceeds 50 per cent by weight of the total metal content, and suitable for use or further fabrication without remelting.

Permission granted to Yuba Mfg. Co., San Francisco, to use the formula set forth in a letter dated March 20, in pricing castings, substantially different from those sold or contracted to be sold during the period from Oct. 1 to 15, 1941, inclusive, is continued. In applying the new formula, the company is required to use the labor and material costs which it would have used on Oct. 15, 1941, even though such costs have increased since that date. Permission granted to Brainerd Foundry Co., Inc., Brainerd, Minn., to sell to Northern Pacific Railway Co., St. Paul, castings at the prices below is continued:

	Cwt.
Grade A castings	\$17.019
Grade B castings	15.743
Grade B chill castings	18.679
Grade B truck and trailer castings ..	18.734
Grade C castings	16.679
Journal bearings	14.248

Permission granted to N. M. Hurn, doing business as Sheltered Oaks Brass Foundry, Stockton, Cal., to sell bronze bushings produced by said foundry on and after April 11, 1942, at 38c. per lb., is continued.



IN CLEANING CARTRIDGE BELT LINKS

SEVERAL years ago when one of the arsenals was developing machine gun cartridge belt links we were asked to recommend the equipment for cleaning them.

These were the requirements: (1) The equipment must remove the heat-treat scale, and any burrs remaining after the punching operations; (2) The surface of the links must be thoroughly roughened to anchor the zinc or Parkerized coating (necessary to prevent corrosion); (3) It must be capable of maintaining a high production schedule; (4) No breakage or damaging of links would be tolerated.

The 27" x 36" **WHEELABRATOR** Tumbblast with rubber apron conveyor, was found to fulfill all requirements, and two machines were installed. They proved so successful in all respects that this equipment has become the standard for more than 95% of all cartridge belt link cleaning jobs.



AMERICAN

FOUNDRY EQUIPMENT CO.

510 S. BYRKIT ST.

MISHAWAKA, IND.

New Farm Equipment

• • • **Maximum retail prices** on new farm equipment are established in Schedule No. 133 effective May 11 and are the sum of:

- (1) The maker's suggested retail price f.o.b. factory.
- (2) An allowance for transportation as explained in the order.
- (3) The manufacturer's handling charge paid by the dealer if not included in the manufacturer's charge for freight.
- (4) An allowance for dealer's handling.
- (5) A charge for special installation of fixed equipment.
- (6) Federal excise tax billed separately by the maker.

Miscellaneous Prices

Majestic Radio & Television Corp. is permitted to sell 13,100 radio receivers in accordance with a petition filed March 4 which showed that oral contracts had been entered into in September and October, 1941, and reduced to writing later.

Barlow & Sellig Mfg. Co., Ripon, Wis., is permitted to substitute

lower cost wringers on several models of its washing machines, which will result in slightly lower prices to consumers.

The maximum charge for the one-year service contract which a manufacturer is permitted to add to the established base prices in sales of domestic mechanical refrigerators permitted by WPB is fixed at \$4.50 in Amendment No. 2 to Revised Price Schedule 102 (Household Mechanical Refrigerators).



Rolled Zinc Products Under Formal Schedule

••• Maximum prices for rolled zinc products, announced April 30, are those published by OPA on Nov. 29, 1941, with slight changes in the prices of zinc, boiler, hull, and engravers' plates. The schedule is No. 124, effective May 11.

The present action was deemed necessary by OPA to prevent price increases and to limit the prices of those producers who did not sign an agreement dated Dec. 10, 1941.

Sheet zinc remains at 13.15c. per lb. f.o.b. mill in l.c.l. lots with 7 per cent discount for carload lots. Ribbon and strip zinc at 12.25c. for up to 3000 lbs., engravers' and lithographers' plates are substantially the same as in the schedule which appeared in THE IRON AGE, Feb. 12. Additional prices include:

Quantity	Maximum Price (Cents per lb.) (F.o.b. Mill)
Sheet Zinc	
Less than carload lots....	13.15c.
Carload lots and larger quantities	7 per cent discount
Ribbon and strip zinc.....	
Up to 3000 lb.....	12.25c.
3000 and less than 6000-lb. lots	1 per cent discount
6000 and less than 9000-lb. lots	2 per cent discount
9000 and less than 18,000-lb. lots	3 per cent discount
18,000 and less than carload lots	4 per cent discount
Carload lots and larger quantities	7 per cent discount
Zinc Plates	
Small (boiler) plates (not over 12 in. in any dimension).	

Quantity	Maximum Price Per lb. (F.o.b. Mill)
3 tons and over	11.00c.
1 ton and less than 3 tons	12.00c.
500 lb. and less than 2000 lb.	12.50c.
100 lb. and less than 500 lb.	13.00c.
Less than 100 lb.	14.00c.
Large (hull) plates (over 12 in. in any dimension). Add 1c. per lb. to prices for	

Gray Iron Ceiling Soon

Washington

••• Price Administrator Henderson said Monday that gray iron castings sold commercially as such were included under the general maximum price regulation issued April 28 but that it is anticipated a maximum price regulation specifically applicable to the industry will be announced before the pro-

visions of the general order become effective for manufacturers on May 11.

The measure will remove the industry from the general order and will take the place of the voluntary price agreements under which the industry has been operating since the issuance of the Administrator's letter of Feb. 4. The provisions of the letter, Mr. Henderson said, will continue in effect until May 11.

AMPCO CASE HISTORIES



Two million reciprocating cycles — more than a year's hard service packed into a single continuous run — the Ampco Metal parts in an outstanding aircraft windshield wiper still showed no signs of wear!

Strength and non-magnetic properties are important in a windshield wiper that may be placed on flying fortresses, swift pursuit ships, or the motor torpedo boats of the mosquito fleet. Strength to survive terrific wind pressures encountered by 400-mile-an-hour combat ships — non-magnetic properties to assure correct compass readings. Ampco Metal has both.

Once again rugged Ampco bronzes met severe service tests and were adopted as standard by critical designing engineers. In every industry where bronzes are used, Ampco Metal is giving exceptional service. Ask for information about Ampco's abilities to stand up under your tests.

AMPCO METAL, INC.

DEPARTMENT IA-5

MILWAUKEE, WISCONSIN

AMPCO

METAL

THE METAL WITHOUT AN EQUAL

AMPCO

New Method of Fixing Export Ratings Adopted

••• A new method of assigning preference ratings to export orders was adopted by WPB. Priorities regulation, No. 9, will govern issuance and use of ratings for export whenever appropriate forms are approved for specified indus-

tries or products. A preference rating assigned under the terms of the order to a product for export may not be applied without an export license or other authorization for export, and the rating will be automatically cancelled if the ex-

port license or authorization is revoked.

Until a form is approved for each type of export product, PD-1A applications will be used. The first approved form issued is PD-311, which is an application for priority rating on materials for export for use of the petroleum industry outside United States and Canada. Ratings for export may be assigned to applicants on this form much in the same manner as ratings are assigned to petroleum enterprises under order P-98. Preference rating orders P-98-a and P-103-a, under which ratings have previously been assigned for exports for the petroleum industry, have been revoked.

When a rating is assigned under the terms of the new regulation, the rating may be served on a supplier by a simple endorsement of the purchase order, similar to the method now used for applying ratings assigned on PD-1A and PD-3A certificates, and is subject to

WPB bans use of metal in production of 360 classifications. See story on page 105.

the limitations of priorities regulation No. 3, governing the use of individually assigned ratings. However, a rating assigned to a product for export under the terms of regulation No. 9, when served on a supplier, must be accompanied by an export license or statement of authority to export and a certificate from the Board of Economic Warfare or Lend-Lease Administration that a rating has been assigned to the order.



Car Builders Ratings

••• Freight car builders' ratings of A-2 or lower were canceled by WPB last Thursday on material for car construction not already received by, or placed in transit to, the car builders with the issuance of supplementary order No. L-97-a-1. This was done to make full use of existing inventories in the hands of all builders before permitting them to receive additional raw materials. Under the order, any producer is permitted to sell and deliver any material in inventory or transit to other builders. This will allow producers to balance their inventories by sale or exchange. Meanwhile, WPB ex-

TO GIVE YOU BETTER SPRINGS *Quicker*

THIS girl and her fellow workers at Accurate are "stepping on it" in more ways than one—crowding their machines to produce springs and more springs. It's like that all through the Accurate plant—the only restraining influence on speed is our exacting inspection. We will not push production to a point where it is necessary to sacrifice accuracy and quality.

Here you can be sure of painstaking attention to every requirement of your order—design, materials and delivery! Yes, sir, our motto is: "step on it" to give you better springs, quicker. Let's talk it over.

Accurate Springs

SPRINGS • WIREFORMS • STAMPINGS

ACCURATE SPRING MFG. CO., 3819 W. Lake St., Chicago

PRIORITIES

cluded mining locomotives from the provisions of the railroad order by an amendment to L-97, priorities for which are controlled by mining machinery order, P-56.

Aluminum Scrap Segregation

••• The maker of segregated scrap, under amendment 1 to order M-1-d, must hereafter furnish the buyer with a signed statement showing the specifications, form, weight, and name and address of the plant where the scrap was generated. The date of sale and names and addresses of the transacting parties must also be shown and any further resale must be similarly endorsed and transferred. Because dealers have been unable to function effectively under the 1000-lb. limitation formerly in effect, the amended order provides that segregated scrap of top quality alloy may be sold to a dealer or an approved smelter as well as to a producer, up to 5000 lb. a month.

Plant scrap is redefined in the order to hold under strict control for recovery as secondary aluminum all scrap which contains 15 per cent or more aluminum by weight. Scrap with less than 15 per cent aluminum content may be sold to any buyer.

Zinc Allocation

••• Beginning June 1, metallic zinc will be placed under complete allocation control by amended order M-11. Zinc oxide and zinc dust will remain under the pool arrangement that has heretofore controlled it, under order M-11-a. Complete details of the WPB release on the order are shown under "Non-Ferrous Metals," page 171.

Canning Substitutes

••• Because more drastic tin conservation measures may be necessary before the beginning of the 1943 food packing season, canners were requested to consider other forms of food preservation such as freezing, dehydrating or packaging in materials less critical than tin. WPB also warned that the necessity for careful conservation of tin supplies will not

permit the allocation of tin for secondary fruits and vegetables beyond the quotas now established on tin andterne plate by order M-81.

Packers who have been given special permission to use certain small can sizes not allowed by the general terms of the order were advised that this relief probably would not be extended through next year, and it was urged that

these packers plan to use only those can sizes specified by M-81.

PD-73 Extension

••• Filing form PD-73 with all purchase orders for steel and iron products is extended until June 1 by amendment 4 to order M-21. This amendment allows purchasers and producers time to re-



Official
U. S.
Navy
Photograph

THE Hele-Shaw Fluid Power Pump

OTHER A-E-CO PRODUCTS: TAYLOR STOKERS, MARINE DECK AUXILIARIES, LO-HED HOISTS



AMERICAN ENGINEERING COMPANY

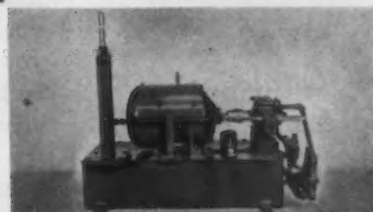
2410 ARAMINGO AVENUE PHILADELPHIA, PA.

"FLEXIBLE as a P.T. BOAT"

—that's Hele-Shaw Fluid Power

Aids location and relocation of machines. Remote control is a big advantage in powder plants.

There's no reason why the location of the power unit of a machine should be a stumbling block—not if the machine can be operated hydraulically. Hele-Shaw Fluid Power solves the problem neatly. Hele-Shaw Fluid Power, being oil under pressure from a Hele-Shaw Pump, is simply piped from the pump, which has been placed at any convenient point, to the driven machine. The unusual flexibility of locating the pump is a real help in assembling new plants quickly, changing over existing plants, operating machines by remote control. Manufacturers of explosive products, especially, will appreciate the great advantage of driving machines from a Hele-Shaw Pump located at a distant, safe point . . . connected only by pipes. It pays to know all the advantages of Fluid Power described in our catalog. Write for your copy.



Hele-Shaw Pump used by a munitions maker for loading shells. Shell loading is done in one room. Pump and operator are in a separate room, from which operator guides loading by mirror set in separating wall.

classify all unfilled orders. Amendment 3 to the steel order called for the elimination of PD-73 in the case of orders to be delivered after April 30. Amendment 4 also provides that it will not be necessary for a producer to obtain the certification, that will replace PD-73 beginning June 1, in cases of orders previously placed to fill lend-lease, or other export or warehouse requirements, inasmuch as

these classifications remain the same as in PD-73.

Metal Window Frames

• • • Metal window frame manufacturers may make basement window frames and residential type casements for use in projects to which a preference rating has been assigned by order P-55 (de-

fense housing), P-19-d (publicity financed housing), or P-110 (remodeling of houses in defense areas) if materials were in inventory prior to March 25. This was permitted by WPB in an amendment to order L-77. The amendment also allows the manufacture until May 15 of any metal window frame pursuant to an order received on or before March 25, if the window is for use in a rated project. The provision of the original order, which permitted the manufacture of any metal window frame to fill an order with an A-2 or higher rating, is continued by the amendment. After May 1, deliveries of material may not be made except under PRP.

JOHNSON BRONZE

SLEEVE TYPE BEARINGS



How to make Good Motors BETTER

NEW Catalogue

Lists and describes the most complete stock bearing service available. Write for your free copy.

It makes little difference whether you are buying, building or repairing motors, JOHNSON BRONZE can help you. In new equipment we can help you design the type of bearing that will guarantee the most efficient operation. For replacements, we offer you the largest range of sizes and types in bearings available. In order to get the most from your motors—consult with JOHNSON BRONZE. Let us help you make good motors *BETTER*.



JOHNSON BRONZE

Sleeve BEARING HEADQUARTERS

505 S. MILL STREET • NEW CASTLE, PA.

Radiosonde Rating

• • • Preference rating order No. P-38, covering materials for the production of radiosondes, was extended by WPB on April 29, to June 30. The order, issued Feb. 26, 1941, and amended Feb. 18, was due to expire April 30.

Machine Tools

• • • Under general preference order E-1-b, machine tool production and delivery was placed under a limited allocation system, effective May 1. Details of the order are shown in the "Machine Tools" section, page 170.

Transportation Rulings:

Local Carriers

• • • A general order curtailing local delivery services as a means of conserving transportation facilities and equipment was issued on April 23 by the Office of Defense Transportation. The order, ODT No. 6, prohibits special deliveries and "call-backs," and limits the number and mileage of deliveries by local carriers.

Effective May 15, local carriers are forbidden to make any special deliveries except to hospitals and U. S. armed forces, and except emergency deliveries of supplies necessary to protect public health,

life, and safety. "Call-backs" made in a second attempt to deliver shipments on the same day or to make collections are prohibited, as is more than one delivery to the same person in a single day, except if deliveries are so large as to require more than one vehicle. After June 1, local carriers using rubber tires are required to reduce their total mileage by at least 25 per cent each month as compared with the corresponding month in 1941.

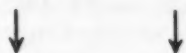
Pooling or curtailing services must conform to the terms of the joint statement issued by ODT and the Department of Justice on March 12, 1942. Plans for joint action may be submitted to ODT for approval to avoid prosecution under the anti-trust laws, but this procedure is not required. Carriers are required to keep mileage records and records of steps taken to comply with the order.

This order applies to all local carriers except those specified in the order, which generally cover vehicles necessary to health, life, and safety, and those engaged by the armed forces.



Freight Cars

••• The use of closed freight cars in any kind of intra-city freight movement where use of motor vehicles is possible was prohibited by amendment No. 1 to general order ODT No. 1. The amendment also establishes weight limits for lcl merchandise and directs carriers to conserve freight cars for preferential transportation of war materials. Specific exceptions to the ruling are listed in the order which became effective May 1.



New Vehicle Use

••• Motor truck dealers were warned by the ODT that anyone converting to use any new commercial vehicle covered by the general conservation order, No. M-100, without legal possession of the vehicle is liable to prosecution under the recently signed War Powers Act.

M-100 prohibits the transfer of new commercial vehicles from the inventories of suppliers to users,

and covers the sale, lease, trade, loan, gift, delivery, shipment, or any physical transfer of such a vehicle involving the use of the vehicle by a person other than the transferer. The warning was issued because of recurrent rumors that new motor trucks are being illegally acquired by truckers in violation of the truck rationing procedure. Applications filled out by the dealer or supplier of new commercial vehicles for their con-

version to his use or the use by anyone else must be submitted to the Local Allocation Office of ODT for rationing procedure.



Foreign Government Orders Rated As "Defense Orders"

••• Czechoslovakia, Free France, Iceland, and Turkey have been added to the list of countries

Equip Your PRESENT MACHINE TOOLS
for DOUBLE PRODUCTION

At Small Cost



Let KENNAMETAL Help You Help the War Effort

There are two ways to speed up the production of steel parts for the guns, tanks, ships and planes we need so much. The first is to acquire more floor space and install more machine tools—a time-consuming and expensive method.

The second way is to install KENNAMETAL tools on your present machines. KENNAMETAL turns, bores and faces steel up to 550 Brinell at speeds 2 to 6 times faster than are possible with high speed steels, removing 3 to 10 times as much metal between regrinds. It can help you double the output of steel parts with equipment already in use.

Write today for the new KENNAMETAL Vest Pocket Manual. It contains simple, complete instructions for selecting and using KENNAMETAL tools.

SALES REPRESENTATIVES FROM COAST TO COAST

EXAMPLES OF WIDELY
USED STANDARD TOOLS

Style #21

Style #1

Style #11



MCKENNA METALS Co.

144 LLOYD AVE., LATROBE, PENNA.

FOREIGN REPRESENTATIVES: U. S. STEEL EXPORT CO.
(Exclusive of Canada, Great Britain and Possessions)

whose government orders are defined as "defense orders" under the terms of priorities regulation No. 1 as amended, it was announced by WPB on Saturday. This means government orders from these countries are automatically assigned a preference rating of A-10 if no higher rating has been assigned by certificate or otherwise, and that such orders must be accepted and placed in production schedules in accordance with the rating.



Revised Ratings Cause Rolling Schedule Confusion

Pittsburgh

• • • According to investigations here, the priority situation in the steel industry is, if anything, more confused than was the case when priority orders were being produced ranging from A-1-a to A-10. Many steel companies at present find rolling mill schedules slated for weeks or months on allocations

and orders no lower than A-1-k. This situation has been brought about by the repeated raising of lower rated orders by WPB into the higher brackets and similar moves in granting outright allocation to other orders which have been retarded in production because of the increasing number of A-1-a's.

Thus, it is said, instead of a real distribution in urgency of requirements, practically all "must" items—which includes the great majority of present requirements for the army, navy, maritime, and lend-lease—fall either in the allocation class or the upper end of the A-1 level.

Some sources believe that before the situation is relieved, re-examination of some higher priority orders by government officials will be necessary. It is believed that a partial solution might be the allocation, before anything else, of certain percentages of available steel products to specific requirements of the army, navy, and other important war uses, with the balance of available products

going as allocations, priorities, or WPB directs. Only in this way, it is said, can the more urgent requirements for war materials be clearly separated from the miscellaneous mass of steel orders now bearing the highest possible ratings.



Truck Rating Changed From A-1-g to A-1-a

• • • Effective April 14, the preference rating for material required for the quartermaster truck program for 1942 has been changed by the Army and Navy Munitions Board from A-1-g to A-1-a. The A-1-a rating will remain in force until further notice. All orders on suppliers' books covered by the truck program, according to WPB, are to be scheduled for delivery in accordance with A-1-a rating, effective April 14.



Order M-21-b, Steel Warehouses, Revised

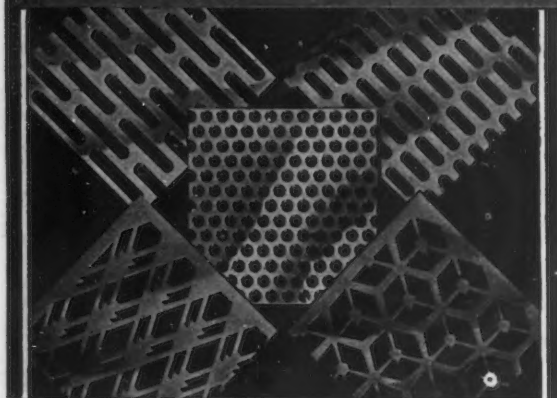
Washington

• • • WPB on Monday revised Order M-21-b, steel warehouses, to make it conform to Order M-21. M-21 forbids deliveries by producers on ratings lower than A-10 except in certain specified cases. The amendment to the warehouse order applies the same restriction.

Warehouses are to receive deliveries on quotas established by WPB director of industry operations. These fall into two classifications. They are, Schedule A and Schedule B products. Applications for Schedule A quotas are to be made on PD-83a. A rating of A-1-k is assigned to warehouses for Schedule A products replacing the present A-9 rating. A-3 is assigned to Schedule B products.

Warehouses must report to the Bureau of Census on or before the 15th of each month on Form PD-83 in regard to Schedule A products and to WPB on PD-83f for Schedule B products. With some exceptions deliveries by warehouses and dealers are made subject to the same restrictions as those imposed on producers. Inventory restrictions also are imposed upon deliveries.

PERFORATED METALS



• Making holes is our entire business and we've made billions and billions of them—little ones, big ones, round, square, oblong and slot holes besides shapely ones in many beautiful designs. Our service is at your command.

•
**INDUSTRIAL
AND
ORNAMENTAL**

•
**ANY
METAL**

•
**ANY
PERFORATION**

The
Harrington & King
PERFORATING CO.

5657 FILLMORE ST., CHICAGO

114 LIBERTY ST., NEW YORK

Priorities Regulation 8

Washington

• • • As a further step toward eliminating forms and reports no longer considered necessary, WPB on Tuesday amended Priorities Regulation No. 8. Under the amendment there will be a discontinuance of reports which are required by construction project rating orders of the P-19 series, including P-19, P-19-a, P-19-e, and P-19-h.



Brass Fire Hose Coupling

Washington

• • • All 2½-in. brass fire hose coupling in the hands of coupling distributors were subjected to a WPB freeze order by Amendment No. 2 to the limitation order on fire protective equipment, it was announced on Tuesday. Manufacturers coupling inventories had been frozen by a previous amendment.

Dravo Starts Welding Schools, Training Stations

Pittsburgh

• • • With state approval, a school for electric welders and other skilled workmen needed in America's all-out war effort opened last week at the Dravo Corp.'s Neville Island plant. This project is part of the state-wide plan to train skilled workers by drawing students upon recommendation of the state placement bureau and the personnel department of the Dravo Corp. The welding schools will be an eight hour a day project and include welding training stations as well as the actual schools.

Electrolytic, Bonderizing Lines to be Ready June 1

Pittsburgh

• • • U. S. Steel Corp. will have one new electrolytic tin plating line and one new bonderizing line for the chemical treatment of black plate completed and in operation around June 1, according to information here. Actual location of these units, part of a substantial program of several to be built, was not disclosed but it is said that work has been progressing rapidly at Carnegie-Illinois Steel Corp.'s Irvin works.

No Order for Auto Die Scrapping Issued

Detroit

• • • The automotive industry was thrown into an uproar late last week with publication of a report that an order had been issued calling for scrapping of all automotive dies including those for 1942 models.

On Friday this brought a denial from George Weymouth, chief of the industrial salvage section of the WPB who had been quoted in the original report. Weymouth said that no such order had been issued but that "after careful analysis, a course of action will be determined."

As pointed out in the "Assembly Line" column of THE IRON AGE recently the scrapping of late model automobile dies would be a hardship, particularly on smaller companies which would be forced to expend millions of dollars to replace the dies when they return to automotive production.

However, a sidelight on this destruction of dies is that techno-

logical advance and changes in models required for sale to the public a few years hence, if the war lasts that long, might result in obsolescence of the dies and the necessity for retooling after the war anyhow.

The statements originally attributed to Weymouth came after a WPB industrial salvage conference of Detroit executives staged last Thursday night. Mr. Weymouth, E. C. Barringer, president of the Scrap Iron and Steel Institute and Howard A. Coffin, co-chairman of the Detroit Industrial Salvage Committee were speakers, along with others concerned in the industry and scrap iron situation.

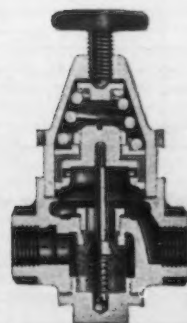
Magnesium Foundry to Open

Cleveland

• • • American Magnesium Corp. will open a new foundry here about June 15 in a reconditioned plant formerly used for storage by Apex Electric Mfg. Co. The new foundry will increase the nation's magnesium casting capacity, a munitions production bottleneck.



In stock for immediate shipment



MAINTENANCE? Well—hardly ever

Hannifin Pressure Regulating Valves are designed and built to deliver accurate, dependable control of air pressures without any tinkering. The exclusive piston-type design gives sensitive, accurate control of working pressure; and allows adjustment over the entire working range to deliver any reduced operating pressure desired.

Piston type construction with long valve stem travel gives large volumetric capacity—a most important feature. Construction throughout is simple and dependable for long life without maintenance.

Use these valves for efficient operation of arbor presses, air chucks, riveters, air vises, cylinders and other pneumatic equipment. Three standard sizes, ⅜, ½, and ¾ inch, for use on initial pressures up to 150 lbs. Furnished complete with pressure gauge. Write for Bulletin 56-A.

HANNIFIN MANUFACTURING COMPANY

621-631 South Kolmar Avenue • Chicago, Illinois

ENGINEERS • DESIGNERS • MANUFACTURERS • DOUBLE-ACTING
PNEUMATIC AND HYDRAULIC CYLINDERS • ALL SIZES

HANNIFIN pressure regulating VALVES

PD-439

Please return 3 copies
of this form to the
Bureau of the Census
Washington, D. C.
before May 10.

BUREAU OF THE CENSUS COLLECTION AGENT FOR
WAR PRODUCTION BOARD
IRON AND STEEL BRANCH

MAXIMUM MONTHLY CAPACITY N.Y.
PRODUCTION, PRECEDING MONTH N.Y.
PRODUCTION, THIS MONTH SCHEDULE N.Y.

COMPANY NAME

SUBSIDIARY NAME

SUBSIDIARY LOCATION

IDENTIFICATION OF REPORT	
PRODUCT	(NAME AND PRODUCT NUMBER - SEE PRODUCT LIST)
GRADE (CHECK ONE BOX ONLY)	UNIT COVERED BY REPORT (CHECK ONE BOX ONLY)
1. ALL GRADES	1. COMPANY OR SUBSIDIARY TOTAL
2. STAINLESS STEEL GRADES	2. SUBSIDIARY, INDIVIDUAL PRODUCT
3. ELECTRIC FURNACE ALLOY GRADES	
4. OPEN HEARTH ALLOY GRADES	

REPORT OF UNFILLED ORDERS AND CONTRACTS FOR IRON AND STEEL PRODUCTS UNDER ORDER W-21, REQUESTED FOR SHIPMENT DURING MONTH

TABLE I

PREFERENCE RATING	NET TONS OF STEEL REQUESTED FOR SHIPMENT DURING <u>MAY</u> , 1942 FOR:									
	TOTAL	ARMY	NAVY	MARITIME COMMISSION	DEFENSE PROJECTS	LEND-LEASE	WAREHOUSES	EXPORT OTHER THAN LEND-LEASE	RAILROADS	ALL OTHER
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
01 - ALLOCATED										
02 - AA										
03 - A-1-A										
04 - A-1-B										
05 - A-1-C										
06 - A-1-D										
07 - A-1-E										
08 - A-1-F										
09 - A-1-G										
10 - A-1-H										
11 - A-1-I										
12 - A-1-J										
13 - A-1-K										
14 - A-2										
15 - A-3										
16 - A-4										
17 - A-5										
18 - A-6										
19 - A-7										
20 - A-8										
21 - A-9										
22 - A-10										
23 - TOTAL A RATINGS										
24 - TOTAL B RATINGS										
25 - TOTAL ALL RATINGS										
26 - UNRATED										
27 - GRAND TOTAL										

TABLE II

PREFERENCE RATING	NET TONS OF STEEL REQUESTED FOR SHIPMENT DURING <u>JUNE</u> , 1942:									
	TOTAL	ARMY	NAVY	MARITIME COMMISSION	DEFENSE PROJECTS	LEND-LEASE	WAREHOUSES	EXPORT OTHER THAN LEND-LEASE	RAILROADS	ALL OTHER
01 - ALLOCATED										
02 - AA										
03 - A-1-A										
04 - A-1-B										
05 - A-1-C										
06 - A-1-D										
07 - A-1-E										
08 - A-1-F										
09 - A-1-G										
10 - A-1-H										
11 - A-1-I										
12 - A-1-J										
13 - A-1-K										
14 - A-2										
15 - A-3										
16 - A-4										
17 - A-5										
18 - A-6										
19 - A-7										
20 - A-8										
21 - A-9										
22 - A-10										
23 - TOTAL A RATINGS										
24 - TOTAL B RATINGS										
25 - TOTAL ALL RATINGS										
26 - UNRATED										
27 - GRAND TOTAL										

SECTION 35 (A) OF THE UNITED STATES CRIMINAL CODE, 18 U.S.C.A. 86, MAKES IT A CRIMINAL OFFENSE TO MAKE A FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

THE UNDERSIGNED CERTIFIES THAT THE ABOVE INFORMATION IS COMPLETE AND CORRECT TO THE BEST OF HIS KNOWLEDGE AND BELIEF.

(NAME OF COMPANY)

BY:

(SIGNATURE OF AUTHORIZED OFFICIAL)

(DATE)

(TITLE)

For Iron And Steel Unfilled Orders And Shipments

Please return 3 copies of this form to the Bureau of the Census, Washington, D. C. before June 15.

PD-138

SHIPMENTS PREVIOUS MONTH _____ N.Y.

COMPANY NAME _____

SUBSIDIARY NAME _____

SUBSIDIARY LOCATION _____

BUREAU OF THE CENSUS COLLECTION AGENT FOR
WAR PRODUCTION BOARD
IRON AND STEEL BRANCH

FOR MONTH OF MAY 1942

IDENTIFICATION OF REPORT

PRODUCT (NAME AND PRODUCT NUMBER - SEE PRODUCT LIST)

GRADE (CHECK ONE BOX ONLY)

1. ALL GRADES ☐ 2. STAINLESS STEEL GRADES ☐ 3. ELECTRIC FURNACE ALLOY GRADES ☐ 4. OPEN HEARTH ALLOY GRADES ☐

UNIT COVERED BY REPORT (CHECK ONE BOX ONLY)

1. COMPANY OR SUBSIDIARY TOTAL ☐ 2. SUBSIDIARY, INDIVIDUAL PRODUCT ☐

SHIPMENTS OF IRON AND STEEL PRODUCTS UNDER ORDER M-21

PREFERENCE RATING	NET TONS OF STEEL SHIPPED ON ORDERS FOR:									
	TOTAL	ARMY	NAVY	MARITIME COMMISSION	DEFENSE PROJECTS	LEND-LEASE	WAREHOUSES	EXPORT OTHER THAN LEND-LEASE	RAILROADS	ALL OTHER
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
01 - ALLOCATED										
02 - AA										
03 - A-1-A										
04 - A-1-B										
05 - A-1-C										
06 - A-1-D										
07 - A-1-E										
08 - A-1-F										
09 - A-1-G										
10 - A-1-H										
11 - A-1-I										
12 - A-1-J										
13 - A-1-K										
14 - A-2										
15 - A-3										
16 - A-4										
17 - A-5										
18 - A-6										
19 - A-7										
20 - A-8										
21 - A-9										
22 - A-10										
23 - TOTAL A RATINGS										
24 - TOTAL B RATINGS										
25 - TOTAL ALL RATINGS										
26 - UNRATED										
27 - GRAND TOTAL										

SECTION 31 (a) OF THE UNITED STATES CRIMINAL CODE, 18 U.S.C. 88, MAKES IT A CRIMINAL OFFENSE TO MAKE A FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

THE UNDERSIGNED CERTIFIES THAT THE ABOVE INFORMATION IS COMPLETE AND CORRECT TO THE BEST OF HIS KNOWLEDGE AND BELIEF.

(Name of Company)

BY

(Signature of Authorized Official)

(Date)

(Title)

• • • Forms PD-138 and PD-139 have been prepared by the WPB for reporting shipments and unfilled orders for iron and steel products, and have been modelled on Forms AIS-17 and AIS-17a of the American Iron and Steel Institute. Certain revisions in the Group Classification as formerly defined in PD-73 have been made, and on and after May 1 all shipments and unfilled orders or contracts are to be classified pursuant to the group definitions in amendment No. 3 to M-21. While PD-73 was originally by amendment 3 abolished, a new amendment, No. 4, issued April 28, provides for the continued use of PD-73 on orders for delivery before June 1.

All producers of iron and steel products, including iron and steel foundries, steel forge shops, and steel mills that may produce one or more products listed in Appendix A—Product Classification List of Iron and Steel Products, must file these reports; with the Division of Current Manufacturers Reports, Bureau of Census, Washington, D. C.

PD-139, created under the amendment No. 3 to order M-21, restricting delivery of iron and steel products after May 15 to orders bearing an A-10 rating or better, is reproduced at left. Filled out in triplicate, this form will report unfilled orders, contracts requested for shipment, and any tonnage upon which shipment is overdue. The report should be filled out in accordance with the preference ratings and the Group Classification of unfilled orders, and filed before the 10th of each month, the first

report being due May 10. A separate report for each product manufactured must be made, and reports should exclude shipments between subsidiaries of the same company for further finishing. The subsidiary that ships the final finished product should report it.

PD-138 is a monthly report of shipments of iron and steel products under order M-21, and shall be filed in triplicate before the 15th of each month, the first report being due June 15, showing May shipments. As in filing PD-139, tonnages shipped should be arranged in accordance with the preference ratings and the Group Classification, with a separate report for each product manufactured.

Following is: Appendix A—Product Classification List of Iron and Steel Products, upon which the new forms base their listings.

- 01 Billets—Shell Steel
- 02 Ingots, Blooms, Billets (Except Shell Steel), Slabs and Sheet and Tin Bars
- 03 Tube Rounds (for seamless pipe or tube)
- 04 Structural Shapes and Piling
- 05 Plates—Rolled Armor
- 06 Plates, including Skelp in Plate sizes—Sheared (except Rolled Armor)
- 07 Plates, including Skelp in Plate sizes—Universal (except Rolled Armor)
- 08 Plates, including Skelp in Plate sizes—Strip Mill (except Rolled Armor)
- 09 Skelp (Other than in plate sizes)
- 10 Rails—Over 60 lb.
- 11 Rails—All Other
- 12 Tie Plates and Track Accessories including Track Spikes, Splice Bars and Rail Joints
- 13 Hot Rolled Bars—Shell Steel
- 14 Hot Rolled Bars—Merchant, All Other

- 15 Hot Rolled Bars—Concrete reinforcing
- 16 Cold Finished Bars—Shell Steel
- 17 Cold Finished Bars—All Other
- 18 Tool Steel Bars (includes High Speed Steel)
- 19 Bars—Wrought Iron
- 20 Pipe—Buff Weld
- 21 Pipe—Lap Weld
- 22 Pipe—Electric Weld including Oil Well Tubing
- 23 Pipe—Seamless including Oil Well Tubing
- 24 Tubing—Seamless, Mechanical or Pressure
- 25 Tubing—Electric Weld, Mechanical or Pressure
- 26 Pipe and Tubes—Wrought Iron
- 27 Pipe and Tubes—Cast Iron
- 28 Wire Rods
- 29 Wire—Drawn
- 30 Wire—Barbed and Twisted
- 31 Woven Wire Fence
- 32 Wire Nails and Staples
- 33 Wire Bale Ties
- 34 Wire Rope and Strand
- 35 Wire, All Other Products including Fence Posts and Gates
- 36 Tin Mill Black Plate
- 37 Tin Plate (Hot and Cold Rolled)—Hot Dip
- 38 Tin Plate (Hot and Cold Rolled)—Electrolytic
- 39 Terne Plate (Hot and Cold Rolled)
- 40 Sheets—Hot Rolled
- 41 Sheets—Cold Rolled
- 42 Sheets—Galvanized
- 43 Sheets—Long Terne
- 44 Strip—Hot Rolled
- 45 Strip—Cold Rolled
- 46 Wheels and Axles
- 47 Forgings—Armor
- 48 Forgings—Other Press and Open Hammer
- 49 Forgings—Drop and Upset—Aircraft
- 50 Forgings—Drop and Upset—All Other
- 51 Steel Castings—Armor
- 52 Steel Castings—Steel Rolls
- 53 Steel Castings—Heat Resistant
- 54 Steel Castings—Corrosion-Resistant
- 55 Steel Castings—All Other
- 56 Iron Castings—Gray Iron
- 57 Iron Castings—Malleable

This Week's Priorities and Prices

Fluorspar maximum price ceilings established by maximum price regulation 126, effective May 11, at levels prevailing Jan. 2. (OPA-PM 3095)

Rolled zinc ceilings established by maximum price regulation 124, effective May 11. (OPA-PM 3096)

Freight car building ratings of A-2 or lower canceled by order L-97, amendment No. 1, effective April 29. Amendment No. 1 excludes mining locomotives from order L-97. (WPB-101)

Lamp and lamp shade manufacturers, under amendment No. 1 to order L-33, effective April 30, may use metal, metal parts, lamp cords, and silk in the manufacture of portable lamps and shades until May 31. (WPB-T 254)

Oil price schedule for tank wagon prices of regular and third-grade gasoline in Midwest and Western territories was amended by amendment No. 9 to revised price schedule 88, effective April 30. (OPA-PM 3082)

Nickel bearing scrap and secondary materials imported must be sold at not more than maximum domestic prices according to amendment No. 1 to revised price schedule No. 8, effective April 28. (OPA-PM 3083)

Camelback maximum manufacturers' selling prices set by price regulation 131, effective May 11. (OPA-PM 3092)

Refrigerator service charges for one year by manufacturer in sale of domestic mechanical refrigerators set at \$4.50 in amendment No. 2 to revised price schedule 102, effective April 30. (OPA-PM 3094)

Iron and steel revised price schedule 6 was amended (No. 4 effective April 30), providing for increased delivered prices on iron and steel products at Toledo, Detroit, and Eastern Michigan, and at Gulf Coast basing points. (OPA-PM 3108)

Protective helmet production and sale banned except on order for the government or United Nations by order L-105, effective April 29. (WPB-1004)

Metal window order L-77, amendment No. 1, effective April 28, permits manufacture of basement windows and residential-type casements for use in certain rated housing projects. (WPB-1009)

Radiosondes order, P-38, extended to June 30. (WPB-T250)

Rubber substitutes subject to direct allocation by amendment 2 to order M-10, effective April 29. (WPB-T251)

Form PD-73 shall be filed with all purchase orders for steel and iron products delivered before June 1 by amendment 4 to order M-21, effective April 28. (WPB-T253)

Iron scrap revised price schedule 4, amendment No. 3, provides an upward adjustment in prices of bundles made up of tin coated materials. (OPA-PM 3047)

Heavy trucks produced under existing quotas allowed tires and tubes by amendment 7 to order L-1-a, effective April 25. (WPB-1001)

Black powder and dynamite does not come under A-1-c rating for mining explosives and explosive equipment granted in an amendment to order P-56. (WPB-T247)

Hairpin output, under order L-104, effective April 25, will be regulated as regards amount of metal used, and length and thickness of products. (WPB-996)

Machinery painting and finishing by machine tool builders controlled by order L-108, effective April 27. (WPB-997)

Dairy repair, maintenance, and operating material applications restricted by amendment No. 1 to order P-118, effective April 27, for use before June 30. (WPB-T238)

Closures amendment No. 1 to order M-104 on glass container closures, rescinded by amendment No. 2, effective April 25. (WPB-T241)

Domestic cooking appliance order L-23 extended for 15 days by order L-23-a to permit conclusion of further studies on an order to replace L-23. (WPB-T246)

Dairy machinery repairs facilitated by order P-118, effective April 18, which gives high ratings for material deliveries necessary for repair, maintenance, and operation of processing and producing plants. (WPB-955)

Construction material supplier for defense housing projects permitted to extend preference rating at any time within three months after entitled to apply it, according to amendment No. 1 to orders P-19-c, P-19-d, and P-55, effective April 20. (WPB-T222)

• • •

For copies of above announcements address Division of Information, WPB (or OPA), Washington, giving announcement number as shown in parentheses after each paragraph. (For example, WPB-600 means announcement 600 issued by the War Production Board.)

Revisions for The Iron Age Priorities Guide

• • • The following data should be added to THE IRON AGE Priorities Guide published with the issue of March 26 to bring the Guide up to date.

Under "P Orders," page 5, add:

P-38...Order on radiosonde production extended until June 30. (4-29-42)

P-56...Interpretation excludes use of A-1-c rating for mine operating supplies, such as dynamite and black powder. (4-28-42)

P-118...Amendment No. 1 restricts application of ratings by dairy processors for repair materials for use before June 30, when order expires. (4-27-42)

Under "M Orders," page 9, add:

M-1-d...Amendment No. 1 places firmer control over the segregation and sale of aluminum scrap. (5-2-42)

M-2-b...Extends magnesium order until Oct. 31, 1942. (4-25-42)

M-6-b...MRC purchase of frozen metallic nickel stocks under M-6-b excepted from provisions of price schedule. (5-1-42)

M-11...Amended order sets up zinc allocation plan. Related forms: PD-450 and PD-94-a. (5-1-42)

M-11-a...Places zinc oxide and zinc dust under pool arrangement by which all zinc had been controlled prior to issuance of M-11. (5-1-42)

M-38-h...May lead pool set at 15 per cent March production. (5-1-42)

M-81...Amendment extends uses of tin plate in food canning. (5-1-42)

M-104...Amendment No. 1 prohibits manufacture of tin, terne, or black plate crown caps except to extent required to make deliveries permitted by M-8-a on cork. Related form: PD-384. (4-24-42)

Under "L Orders," page 12, add:

L-4-b...Supplementary limitation order controls manufacture of storage batteries from April 30 to Sept. 30. (4-26-42)

L-42...Restricts manufacture of direct fired gas storage water heaters and vapor and vacuum heating specialties. (4-25-42)

L-77...Amendment No. 1 permits manufacture of metal windows and casements on certain rated housing projects. (4-26-42)

L-94...Regulates power consumption and provides for utilization of power generating facilities.

L-97-a-1...Cancels A-2 or lower rating on material for freight car construction not received by or in transit to producers, and permits interchange of material between producers. (4-30-42)

L-98...Restricts production of domestic sewing machines and attachments until June 15, after which date production must cease. (4-25-42)

L-104...Restricts amount of metal used in hairpin and bobbin manufacture. (4-27-42)

L-105...Prohibits manufacture and sale of protective helmets. (4-29-42)

L-108...Restricts paint finishing of machine tools to "old machine tool gray." (4-27-42)

Under "E Orders," page 14, add:

E-1-b...Limited allocation system on production and delivery of machine tools. Related forms: PD-1-a, PD-3, PD-3-a, PD-4. (4-30-42)

Under "Priority Regulations," page 14, add:

No. 9...Explains new system for assigning preference ratings to export orders. Related form, PD-311. (4-25-42)

Rolling Schedules In May Completely Rated, Olds Says

• • • More than 99 per cent of the steel on Carnegie-Illinois Steel Corp.'s rolling schedule for May carries a priority rating of A-1-k or better, while the remainder of 15,000 tons also is covered by priority ratings, I. S. Olds, U. S. Steel Corp. chairman, told stockholders at their annual meeting May 4 at Hoboken, N. J.

In an explanation of the company's war efforts, including showing of a motion picture "Steel for Victory," Mr. Olds said that Carnegie-Illinois is producing plate at the rate of 3,600,000 tons yearly, nearly three times the 1940 production rate.

Part of Mr. Olds' talk to the stockholders dealt with allegations of the WPB regarding violations of priority regulations by the company. "The stockholders of the corporation are entitled to know that full compliance with priorities has been from the very outset, and will continue to be, the firm policy of the corporation and all its subsidiaries." (The WPB, through the Department of Justice, is seeking an injunction against alleged priority violations.)

"This is a serious accusation," Mr. Olds said. "Everyone should recognize that the conversion of the industrial machinery of this country from a peacetime to a wartime basis has not been a simple and easy accomplishment, either for the government authorities at Washington or for those in charge of industry. Not so many months ago a very large proportion of the production of the steel industry was not affected in any way by preference or priority ratings.

"The whole system of priorities and allocations has been a gradual evolution over a period of many months, effected through the issuance by the government of numerous rules, regulations and directives. These various regulations and orders have been revised, amplified and extended from time to time. They have not been entirely free of ambiguity, gaps and contradictions, and a literal compliance therewith was difficult, to say the least.

"These words are not spoken in criticism of anyone," the steel

chairman said. "The orderly scheduling of a large steel rolling mill is a most complicated affair. The task of those at Washington formulating the priority orders and regulations and of those at the steel mills putting rolling schedules into effect to accord with these orders and regulations was highly involved and difficult."

With the magnitude of Carnegie-Illinois' operations, it would be remarkable if there have not been

some instances since May 31, 1941, where strict compliance with priority orders and regulations has not taken place, but I can assure the stockholders of the corporation that such instances, if any, have not been "deliberate" and have been of relatively minor significance in comparison with Carnegie-Illinois' vast contribution toward the fulfillment of the government's defense and war production programs.

Canadian Iron and Steel Output at Record Totals

Toronto

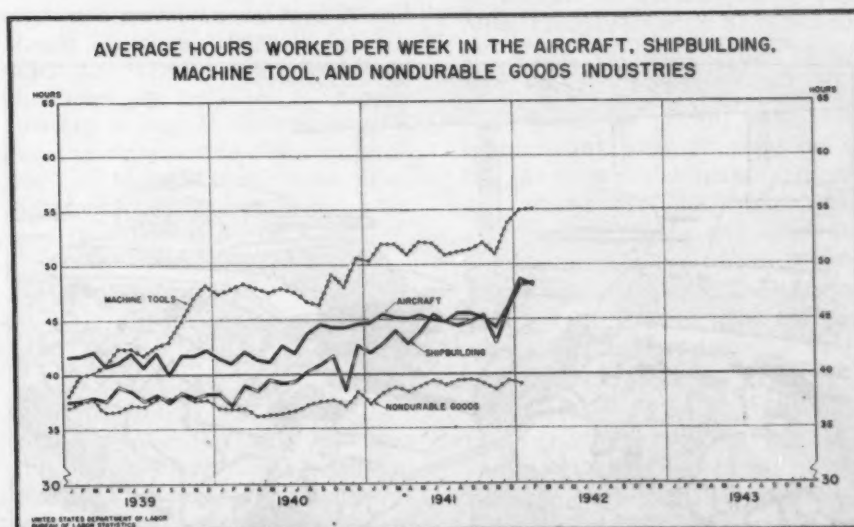
• • • Canadian pig iron production for the first quarter of 1942 attained the all time record of 474,245 net tons, a gain of 60 per cent over the 296,288 tons reported for the same period a year ago. Production for March also was of record proportions totaling 167,116 tons compared to 143,973 tons in February, 1942, and 102,038 tons in March, 1941.

Production of ferro-alloys for the quarter made the record total of 55,624 tons, compared to 41,903

tons made in the same period of 1941.

Steel ingots and direct steel castings totaled 807,840 net tons for the first quarter, 45.68 per cent above the 554,482 tons reported for the corresponding period last year. The march production of steel ingots and castings was 265,903 net tons compared to 242,921 tons in February, 1942, and 218,939 tons in March, 1941.

During March, steel furnaces in Canada operated at 98 per cent of capacity, blast furnaces at 96 per cent. As in February, ten out of a total of 11 furnaces in Canada were in blast.



INDUSTRY'S WORK WEEK LENGTHENS: In more than half of war production plants surveyed, workers averaged more than 48 hr. per week in February, according to the U. S. Bureau of Labor Statistics. The entire machine tool industry averaged 55 hr. Nine plants were averaging more than 70 hours per week per wage earner. Sunday operations have been confined chiefly to continuous process industries. Of the iron and steel mills surveyed, 36 per cent had more than 50 per cent of their wage earners at work on Sunday. Only 16 per cent of the plants in 14 other war industries as a whole had such crews on Sunday work. Marked progress has been made in most war industries in moving toward continuous operation to increase output. Exclusive of the major continuous process industries, about 40 per cent of the war workers are now on extra shifts, as compared with approximately 25 per cent in December, 1940.

Converting Car Shops Is Headache for WPB

Pittsburgh

••• Latest headache for WPB is the vast job of converting railroad car building shops to direct war production made necessary by the curtailment in the number of freight cars that may be manufactured. Some car shops are already building ships or ship parts and more are to be converted to this effort. Furthermore, reliable information indicates that many shops are all set to go when present authorized freight car backlogs are completed. The job of converting the entire industry, however, is expected to be difficult in view of the type of equipment, etc., at car building plants. Several plants already have initial munition orders and are expected to expand in that direction.

Confusion has surrounded the question as to how many freight cars may be made this year. As of this week 45,000 freight cars which constitute a requirement of 9000 in January, and 36,000 for the months of February, March and April, are completely authorized and earmarked and steel and equipment will be furnished to complete this program. It is doubt-

ful if the last of these cars will be produced before June or July. In the meantime, freight car builders including railroads were instructed to suspend all steel orders and specialty equipment commitments on units which were not included in the 45,000 cars. Steel and specialties were also ordered suspended on the 18,000 cars subsequently allowed by WPB unless priority ratings were A-1-j or higher. Rough estimates indicate that the steel industry and railroad equipment concerns will receive suspensions on approximately 25,000 or more freight cars which do not come within the scope of the program approved by WPB. The withdrawal of priority assistance less than A-1-j on the latest 18,000 cars which the WPB will allow manufacturers to make, means that the production of these units which constitute 4500 hoppers, a like amount of gondolas, 2000 flat cars and 4000 tank cars, plus other units, will depend entirely upon the redistribution of freight car builders' inventories and other material now on its way to builders. Opinion here is that a large part of the 18,000 cars will not be completed this year unless specific priority assistance is reinstated by WPB later.

New OPA Rulings Clarifying Extras

(Continued From Page 145)

the customer and the factor necessitating such lesser shipment is other than WPB regulations, the usual and customary practices for determining the amount of the quantity discount or extra which were followed prior to April 16, 1941, may be used.

D. This redefinition in no way affects the provision in Price Schedule No. 6 which states that the schedules shall not be evaded "by the splitting of orders into small quantities with design to increase prices."

Reclassification of products with design to increase price.—The OPA has said that where a producing mill because of limitation of available physical facilities has customarily been selling wire rods as wire rods even though produced on a bar mill to a particular customer on or during the two years preceding April 16, 1941, it is not permissible to reclassify such rods as bars and sell at the bar price with the effect of obtaining a higher price, whether such sales are made to a particular customer or otherwise. This is taken to mean that the OPA has ruled that wire rods sold as wire rods take the wire rod price regardless of whether they are made on a bar mill.

Term of payment.—The OPA has said that on government orders the steel industry as a whole has granted maximum cash discounts, even though some time has elapsed because of strict auditing practices on government orders, and the OPA has requested that the steel industry continue this treatment.

Power Systems Ordered Integrated by WPB

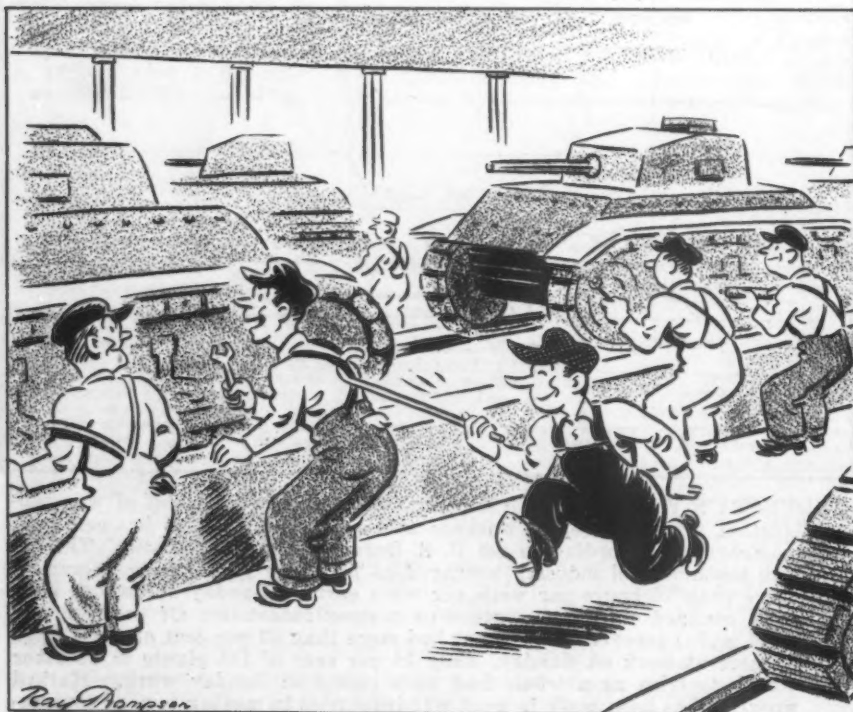
Washington

••• Anticipating power shortages caused by increased electricity consumption in war plants, WPB ordered integration of systems to permit transfer of power from one locality to another and established machinery for mandatory curtailment of power use when shortages occur. The order, L-94, requires each utility to operate its facilities and interchange power with other companies in a manner that will coordinate power supply for war production and essential civilian uses, and for relief of power shortages.

Another New Peak Set in Hamilton Stack's Output

Middletown, Ohio

••• For the second consecutive month, the Hamilton plant of American Rolling Mill Co. has set a new high monthly record for production of pig iron. The new peak was accomplished despite a 30-day month, as against 31 in March; that during April repairs were made to one of the blast furnaces while it was in operation, and in the face of a shutdown for three days of one furnace for repairs.



"That was a swell idea—assigning Bennie to keep our suspenders from riding during the speed-ups."

GM Ends All Parts Manufacture Except on Government Order

••• Cited for violations of priority regulations and ordered to stop manufacturing for 90 days replacement parts for passenger automobiles; light, medium and heavy trucks; truck trailers; passenger carriers; and school bus bodies; General Motors Corp. announced that it was suspending the manufacture of all kinds of automotive parts "in order to avoid any further implications concerning the corporation's war effort."

The WPB stop-order, instigated by charges of violations by the UAW-CIO, came as GM was engaged, along with other manufacturers, in completing runs of replacement parts intended to service vehicles for about 2½ years. The WPB order was handed down after it had studied the charges by UAW that the Ternstedt division had used chromium steel and aluminum for "bright work" on cars.

C. E. Wilson, GM president, instructed all GM subsidiaries that "under no circumstances are any tools, dies or material to be sent outside to others for production." The only parts-making that will be continued is that directly on government order, such as replacement parts for military trucks. The UAW complaint and WPB order concerned about two tons of chromium steel, and proportionate amounts of primary and secondary aluminum, a total of about six tons of light metal.

It was regarded in the automotive industry as significant that the UAW complaint was made exactly 60 days previous to the expiration of the then-current contract between UAW and General Motors. The WPB order was issued just after the expiration date and four days before the contract dispute was to be taken up by the War Labor Board in Washington. The timing is considered indicative of an attempt by the UAW to wage a smear campaign.

While the "stop production order" permits continued work on "functional" parts, it raises the point that a definition of the word is needed. A radiator grille, for example, is usually considered part of the decorative treatment of the car, but fenders and headlamps are held in alignment by the grille in many designs so that the grille serves functional purposes.

WPB Will Check Upon Plants' Production

Cleveland

••• The WPB will check all Cleveland plants with an eye toward learning whether or not present methods in production are yielding the maximum output, according to John C. Virden, regional director of the WPB. Virden said that plants not engaged in war work will be visited by WPB specialists, as well as plants, and that the survey would be followed by similar inspections in other parts of Ohio, as well as in Kentucky, Michigan, West Virginia, and southern Pennsylvania. Mr. Virden stated, "It is our intention to increase war production as quickly as possible, but we will not barge in where we are not wanted. The WPB is of the opinion that a greater effort can be made in most plants engaged in war production. It is the aim of the WPB to make sure that every tool, machine, and facility available is being used to the utmost." He stated that some plants in this area apparently were still operating on a "business as usual" basis.

The specific WPB charges are that between Jan. 7 and March 9, the Ternstedt Mfg. Div. of General Motors used 10,259 lb. of chromium steel, and that between Jan. 24 and March 13, it used 9239 lb. of primary and 11,492 lb. of secondary aluminum in violation to supplementary orders M-1-e and M-21-d, and the company has been prohibited to manufacture other than functional replacement parts as defined in orders P-57 and P-107.

Reed Adds to Staff

••• Philip D. Reed, Chief of the WPB Bureau of Industry Operations, on April 24 announced two appointments to his staff.

E. Raymond Schaeffer becomes Chief of the Safety and Technical Equipment Branch. Mr. Schaeffer had previously served as Chief of the Optics Section of the Ordnance Branch of the Production Division. Before that he was president of the American Scientific Equipment Co., New York. W. M. Black, appointed as special assistant on requirements to Mr. Reed, is a certified public accountant and a member of the firm of Peati, Marwick & Mitchell Co., New York.

Steel's Net Income per Dollar Of Sales Dropped 23% in 1941

••• During 1941, net earnings of the steel industry amounted to approximately 6.2c. on each dollar of the largest sales volume ever recorded in the industry. Although sales last year increased over 1940 by over 50 per cent, due largely to the vastly expanding defense and war demands, earnings per dollar of sales declined 23 per cent.

Total sales for the industry in 1941 are estimated at \$5,260,000,000 compared with \$3,489,000,000 in 1940 and a previous peak of \$3,800,000,000 in the first World War year of 1918, according to the American Iron and Steel Institute.

In 1941 the industry's profit of 6.2c. on each dollar of sales compared with 8.1c. in 1940. For 1942, earnings per dollar of steel sales are expected to be even lower than 1941. In 1941 the industry's payrolls amounted to \$1,679,000,000, compared with \$1,180,000,000 in 1940, an increase of about 40 per cent. Those totals include payrolls of certain steel company subsidiaries which do not make iron and steel products.

Dividends paid to 532,000 stockholders of steel companies last year amounted to \$167,000,000 or about 10c. for each dollar of payrolls, compared with \$138,000,000 and 11.7c. for each dollar of the steel industry's payrolls in 1940.

Earnings of steel companies representing over 90 per cent of the industry's steelmaking capacity totaled \$327,328,000 in 1941, after federal, state and other tax payments totaling \$590,930,000. This compares with earnings of \$281,228,000 in 1940, after tax payments of \$225,323,000, the Institute reports.

The return on aggregate investment last year was 8.1 per cent, compared with 7.5 per cent in 1940 and 9.2 per cent in 1929. Tax payments were 162 per cent larger last year than in 1940, while output of finished steel rose 28 per cent.

Last year's net earnings were larger than for any year since 1929, but they were 28 per cent less than the \$455,000,000 earned in 1929, although output of finished steel was over 35 per cent greater last year than in 1929.

PERSONALS

• **E. W. Jackson** has been appointed assistant to the president of the Caterpillar Tractor Co., Peoria, Ill. **D. O. Nash** has been promoted to succeed Mr. Jackson as general service manager. Mr. Jackson had been general service manager of Caterpillar since January, 1937. He served as junior engineer for the United States War Department, becoming proof director of the Ordnance Department at the Aberdeen Proving Ground. In 1929, when the Caterpillar Tractor Co.'s diesel engines were in an early experimental stage, he took a position in the Caterpillar research laboratory at San Leandro, Cal. He was transferred to Peoria in 1933. Mr. Nash joined Caterpillar Tractor Co. at San Leandro in 1937, after seven years in the service department of the Cousins Tractor Co., Caterpillar distributor in California. In 1940, he joined the field service division of Caterpillar at Peoria. He has also served as manager of the service development division and manager of the service engineering division.

• **H. M. McCormack**, formerly sales division manager, Atlantic Division, has been promoted to the general sales department of the American Can Co., New York. **F. E. Uihlein**, formerly assistant to Mr. McCormack has been appointed to succeed Mr. McCormack. Other promotions announced by the company are as follows: **R. H. Lueck**, formerly manager of research department, has been appointed director of research, with headquarters at Maywood, Ill.; **Dr. R. W. Pilcher**, formerly assistant to the manager of the research department at Maywood, has been named assistant director of research; **Dr. B. S. Clark**, formerly manager of the research department at San Francisco, has been made associate director of research, in charge of Pacific District Laboratory, with headquarters at San Francisco, and **D. F. Sampson**, formerly manager of the research department for the Northwestern District and British Columbia, has been appointed assistant director of research in charge of Northwestern District Laboratory, with headquarters at Seattle.

• **Frank U. Hayes** has been named as assistant sales manager of the

Bullard Co., Bridgeport. Mr. Hayes became associated with the Bullard Co. in 1935. In 1936 he was assigned as the sales representative of the company in the Middle Atlantic territory. In 1941, he became a technical advisor in the tool section of the production division of the OPM and, upon his return to the Bullard Co., established the firm's subcontracting division.

• **W. J. Adamson**, formerly manager of carbon steel sales for the Allegheny Ludlum Steel Corp., Pittsburgh, has been made man-



E. W. JACKSON (top), and **D. O. NASH**, assistant to president and general service manager, respectively, Caterpillar Tractor Co., Peoria, Ill.

ager of the enlarged flat-rolled products department. **H. F. Porter** was appointed assistant manager of the electrical materials division, which remains as an integral division within the flat-rolled products group. Prior to the merger in 1938, Mr. Adamson was manager of Allegheny Steel Co.'s hot and cold-rolled strip steel division. Before his Allegheny connection, he was associated with Youngstown Sheet & Tube, and the Acme Steel Company. Mr. Porter has held successive responsible posts with Pyroelectric Instrument Co. and Ajax Electrothermic Corp., both of Trenton, and Valley Appliances, Inc., Rochester, N. Y., before entering the electrical alloys division of the former Allegheny Steel Co. in 1929.

• **W. R. Kuhn** has been named district manager of Allegheny Ludlum Steel Corp.'s Cleveland office. Mr. Kuhn started in the New York office of the former West Leechburg Steel Co. in 1915. In 1923, he opened a New England office for the company in Hartford, and was there until 1930, when he became manager of the Pittsburgh district. He opened a Cleveland office for West Leechburg in 1934, becoming district sales manager for the Allegheny Steel Co. in Cleveland, when West Leechburg merged with the Allegheny in 1936. Two years later, when Allegheny and Ludlum merged, Mr. Kuhn was made assistant district manager in the Cleveland office.

• **Louis R. Wallack** has been appointed in charge of industrial relations by Clarke-Harrison, Inc., Philadelphia. Mr. Wallack has for the past three years been personnel director of R. M. Hollingshead Co., Camden, N. J.

• **Alan Kissock**, vice-president of the Climax Molybdenum Co., who has been in charge of its conversion plant at Langeloth, Pa., has resigned his position. **Arthur Linz** has been appointed vice-president to succeed Mr. Kissock. In addition to the management of the Langeloth operations, Mr. Linz will continue to direct the activities of the company in the chemical field.

• **Sidney P. Cary** has been appointed general superintendent of the Buffalo Bolt Co., North Tonawanda, N. Y., to fill the vacancy caused by the death of George F. Blasier. Mr. Cary was formerly assistant general superintendent.

• **Major John Slezak** has been assigned new duties as chief of the Tank and Combat Vehicles Division of the Chicago Ordnance District. Major Slezak is on leave of absence from his position as president of Turner Brass Works, Sycamore, Ill. He joined the staff of the Chicago Ordnance District on January 26, 1942, as assistant chief of the ammunition division.

• **David W. Jenkins**, who joined Henry Disston & Sons, Inc., in 1896, has retired as general sales manager of the company. He pioneered the West for Disston, establishing the first company branch on the Pacific coast in 1909. He was responsible for the development of the first thin planer knife made of other than tungsten steel which in the event of today's war needs has been destined to play a great part and for the acquisition by Disston of the famous Philbrick cutter-head.

• **John J. Carter**, former General Motors factory manager, has been named supervisor of production engineering for the War Production Board. Mr. Carter has more than 30 years' experience as a tool engineer, tool room foreman, factory manager and manufacturing engineer for General Motors, both in the United States and Europe.

• **C. H. Buckmaster**, formerly in the Pittsburgh office of the Lincoln Electric Co., Cleveland, has been named district manager of the company's Detroit office, replacing **A. F. Boucher** who has been assigned to the Ordnance Department. **J. H. Cunningham** of the Detroit office has been named to succeed Mr. Buckmaster at Pittsburgh and **George Bain** has been transferred from the Detroit territory to the Saginaw area.

• **Fred E. Lacey** has been elected president of the Lacey Mfg. Co., Inc., Bridgeport. He remains as treasurer but is replaced as secretary by **S. W. Lasto**.

• **Harkness W. Cram** has been elected vice-president in charge of sales of the Aircraft Screw Products Co., Inc., Long Island City, N. Y. Mr. Cram had formerly been sales manager of this organization.

• **Robert Grant** has been made vice-president in charge of manufacturing for the Young Radiator Co., Racine, Wis. He has been with the firm for the past year

and received his early production training with Nash motor division of the Nash-Kelvinator Corp.

• **W. D. Bronson** has been appointed district manager for the Chicago area of the Carboly Co., Inc., Detroit. Mr. Bronson, formerly assistant manager in Chicago, succeeds **W. W. Fullager**, who has resigned from the company.

• **Arthur H. Losey** has joined the staff of the Automatic Polishing & Buffing Division of Hammond Machinery Builders, Inc., Kalamazoo, Mich. Mr. Losey for the past six years was associated with the J. C. Miller Co., Grand Rapids, as engineer and adviser on all polishing and buffing problems.

• **T. N. Anderson** has resigned as comptroller of the American Can Co., New York, and has been replaced by **W. J. Wardell**. Mr. Anderson has resigned in order to devote more time to subjects which come under his jurisdiction as executive vice-president. **A. H. Carpenter** has resigned as auditor and will devote his time to specialized subjects including war matters as a representative of the comptroller. **W. B. Ong**, formerly assistant auditor, has been appointed auditor, and **J. McCambridge** has been appointed assistant auditor and will supervise factory accounting. **Leonard Michael**, former manager of the labor division, industrial relations department, will resume his former title of assistant manager of the equipment division and will take up increased responsibility in that division which will include general supervision of labor and personnel matters. **S. D. Arms**, former assistant manager of manufacture, Atlantic division, has been appointed manager of the labor division, industrial relations department.

• **E. Kuehn**, formerly factory manager, Electro-Motive Division, General Motors Corp., La Grange, Ill., has been named special representative in the railroad transportation field. **A. J. Heseltine** has been promoted from the position of chief inspector to factory manager with **J. H. Hruska** advancing to the chief inspector post. **L. E. Simon** has been appointed chief metallurgist, replacing Mr. Hruska.

OBITUARY . . .

• **John T. Boyd**, Pittsburgh salesman for the General Refractories Co., and for years well-known throughout the blast furnace and steel industry, died recently. Mr. Boyd was with General Refractories or its associated companies for more than 50 years. As a boy, he started his career with Mr. Keir, of the Keir Fire Brick Co., which was taken over by General Refractories several years ago. He was 70 years old.

• **Robert F. Vogt**, chief consulting engineer of the Allis-Chalmers Mfg. Co., Milwaukee, since 1937 and an employee of the company for 36 years, died April 17 after a week's illness. Joining the Allis-Chalmers organization in 1907 as a mechanical engineer, he was appointed assistant chief consulting engineer in 1921. In 1937 he succeeded **J. F. Max Patitz** as the company's chief consulting engineer.

• **Samuel Kirtland Hine**, former vice-president of Youngstown Foundry & Machine Co., and at one time district manager for A. M. Byers Co., Girard, Ohio, died April 24, aged 74 years. Mr. Hine had started his business career as a chemist for the old Mahoning Valley Iron Co., later transferring to the Salem Iron Co. in Salem, Ohio, and in 1895 held a similar position for Otis Steel. In 1902 he became superintendent of Mattie stack of the Girard Iron Co., a subsidiary of A. M. Byers Co., subsequently becoming manager of the works. When the plant was dismantled in 1931, he retired from active business.

• **William J. Alles**, former assistant factory manager of Dodge Brothers Co., died recently, aged 69 years. He had been an employee of Dodge for 21 years. He planned and operated the Dodge Ordnance plant in World War I. In recent years he maintained his own sales engineering business in Detroit.

• **Allison Sharp**, vice-president of the Wicaco Machine Corp., Germantown, Pa., died May 4. A graduate of Germantown Academy, Mr. Sharp began his business career with the Penn National Bank. In 1915, he became associated with the Wicaco corporation.

MACHINE TOOLS

... SALES, INQUIRIES AND MARKET NEWS

Machine Tool Allocation Order Issued by WPB

Washington

• • • Machine tools were placed under a limited allocation system by WPB last Saturday with the issuance of Order No. E-1-b, effective May 1. Tools are to be apportioned out of each producer's monthly deliveries, 75 per cent to the Navy Bureau of Ships, the Navy Bureau of Ordnance, Army Ordnance, Air Services, Miscellaneous Bureaus and Branches and the Maritime Commission, and 25 per cent to foreign and other purchasers. The order supersedes Order No. E-1-a except as to deliveries of chucks and gages.

The types of tools are divided into two groups. Each producer is required to revise his delivery schedules for tools in Group I, before June 1 and for Group II before July 1. All deliveries of tools after these dates must be made in accordance with the order. A new numerical master preference list has been formulated to cover the sequence of deliveries to service purchasers, but will have no effect upon other purchasers.

Tools of foreign purchasers are given a blanket A-1-a preference rating, and no preference rating certificates are required for such orders. The purchase orders, however, must be placed through the Army Ordnance Department or through the Treasury Procurement Division.

The percentages of allocation may be reduced to the extent in each case that purchase orders are not placed for such percentages four months prior to the month of delivery. Any producer who has received rated purchase orders for foreign and other purchases exceeding 25 per cent of his production of any size or type of tool for any month is required to report such orders to the WPB for analysis and further directions with respect to deliveries.

A confidential list specifies the percentage of each type of tool to be delivered each month to different groups of service purchasers.

The sequence of deliveries shall be determined by required delivery

dates, preference ratings and by the new urgency standing list. Subcontractors, not listed, take urgency standings of prime contractors.

Where a producer cannot schedule delivery of a tool in the month required by a purchaser, because the percentage allocation or quota of such purchaser's class or group is entirely exhausted, the producer shall schedule the tool for delivery in the earliest succeeding month during which it can be included in the percentage allocation or quota of such class or group in accordance with the purchaser's urgency standing or preference rating.

Dealers Learn of Progress In Machine Tool Industry

Cleveland

• • • Some 260 machine tool dealers from coast-to-coast met here May 1 to hear WPB officials make encouraging off-the-record comments about the machine tool situation, topped off by the statement of George H. Johnson, president, NMTBA, and of Gisholt Machine Co., that "machine tool production is so great that we are rapidly approaching the point where machine tools can machine all available materials." His audience of experts largely concurred, in opinions expressed to THE IRON AGE. They expect that the war program will be a race between machine tool builders and producers of ferrous and non-ferrous materials in arriving at their tremendous war goals.

Machine tools today are idle because steel casting producers can't keep up with all urgent needs, while non-ferrous castings, particularly aluminum and magnesium, and various types of semi-fabricated brass can't meet the appetite of machine tools in war plants. Even so, there is still much to be done by the industry to supply the equipment to machine the millions of tons of metals that will be available at the end of the expansion program in metals.

Observers report that a fourth wave of buying is close at hand, thus following quickly upon the

heels of the third wave which was climaxed in late March. Recent equipment purchasers include the Standard Products Co., which bought almost two million dollars' worth of machine tools and attendant accessories. Meanwhile, the long-awaited announcement of plant expansions by the Lucas Machine Tool Co. finally occurred last week, when the company contracted for the construction of a new plant to produce boring mills.

It is reported that the WPB has clamped down upon machine tool orders requesting especially-built motors, thereby affording a large measure of relief to the hard-pressed motor manufacturers.

Navy Expands Tool Plant

Cincinnati

• • • In line with the steady effort on the part of local machine tool manufacturers to increase production, a second addition is to be added to the plant of the American Tool Works. The new addition will be built by the Navy Department, according to L. W. Scott Alter, president of the Cincinnati firm. The Navy has completed negotiations to acquire 13 parcels of land adjoining the present factory and when the new edition is completed, probably by early fall, the factory will occupy an entire city block. The new addition will add about 40,000 sq.ft. of floor space to the plant. Last August the company itself added 38,000 sq.ft.

Elsewhere in the district, pressure by management to increase production is receiving good response and the general feeling in the trade is that a high record of 1941 will be far exceeded during the present year.

Heyl & Patterson Awarded "E"

Pittsburgh

• • • Heyl & Patterson, Inc., which is building cranes for Navy, two of which are large hammerhead cranes already in operation, received the Navy "E" award last week. The recognition was predicated on specially designed and manufactured items, rather than on mass production work.

NON-FERROUS METALS

... MARKET ACTIVITIES AND PRICE TRENDS

WPB Announces

Zinc Allocations

••• At last WPB announced that metallic zinc will be placed under complete allocation control beginning June 1, under an amended Order M-11 which sets up the plan. Order M-11-a, issued at the same time, places zinc oxide and dust under the pool arrangement that has controlled distribution of zinc products heretofore. Each consumer will apply monthly for an allocation certificate to be forwarded to his producer, who will endorse it for the amounts shipped by grades.

Zinc dealers must also apply for allocation certificates, dealers using form PD-450, and other consumers applying on form PD-94-a. Both forms must reach WPB by the 15th of the month.

Anticipatory shipments up to 25 per cent of the previous month's total may be made by a producer, pending receipt of the allocation. Purchasers of zinc from dealers require no certificate but quantities will be limited. Producers of remelt zinc, and those working under toll agreements must also report to WPB.

Allocation comes as no surprise, but details are awaited eagerly. Some quarters feel the announcement is ill-timed, since the zinc industry may shortly be included in the Production Requirements Plan, and the work of setting up the allocation system will then be tossed out the window.

The zinc pool for May sets aside 75 per cent of January production of high grade and special high grade, and 50 per cent of all other grades of metallic zinc. Zinc oxide is set at 10 per cent of the January figure. No zinc dust must be set aside this month.

Canada's nickel output will be increased substantially in the next year and a half. International Nickel Co., of Canada, will spend nearly \$35 million to increase its output by 25,000 tons over the 1940 figure—a rate scheduled to be attained by 1943. The Ontario Nickel Corp. is making rapid progress on plans to resume oper-

ations at one of its mines. A power line, now under construction, is expected to be delivering energy by June 1. All equipment will be electrically operated, and completion of the line will permit dewatering preparatory to actual resumption of operations. Pending installation of a concentration plant this unit is expected to ship 300 tons of sorted ore a day.

Announcement last week that MRC would buy surplus spot mercury at \$192 a flask, f.o.b., New York reopens the question of the economics of the industry. The maintenance of a floor at this high figure is unnecessary for war production purposes, according to M. W. Stieh, vice-president of F. W. Berk & Co., Wood Ridge, N. J. His carefully prepared estimate, based on probable production in the United States, Canada and Mexico, indicates an excess of

supply over demand of 60 per cent, or 30,000 flasks. We will probably require 50,000 flasks this year, and produce 80,000. The result is that many sub-marginal producers have been brought into the market.

Non-Ferrous Prices

(Cents per lb. for early delivery)

Copper, Electrolytic ¹	12.00
Copper, Lake	12.00
Fin, Stratton, New York	52.00
Zinc, East St. Louis ²	8.25
Lead, St. Louis ²	6.35

¹ Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 15c.-16c. a lb.; No. 12 remelt No. 2, standard, 14.50c. a lb. NICKEL electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt; Asiatic, nominal, New York; American, 14.50c. a lb., f.o.b. smelter. QUICKSILVER, \$197 to \$199 per 76 lb. flask, f.o.b. shipping point. BRASS INGOTS, commercial 85-5-5-5, 13.25c. a lb.

WHAT

—burrs—

makes a spring grow old?

—seams—

—surface defects—



It's a good spring that wears out from old age. Many springs may grow old before their time because of unnoticed surface defects. Burrs, seams, pitting, cracks—all contribute to early spring failure—unless care in manufacture and laboratory inspection weeds them out. Surface defects often invite corrosion—also a contributing factor to a short life. Here at Dunbar's, spring materials are inspected, analyzed—before manufacture. All the way through, great pains are taken to waylay defects before they reach your assembly line. It's just this kind of care that earns for Dunbar a reputation for springs of better quality—long life.

"Quality Springs Since 1845"

Dunbar Bros. Co., Bristol, Connecticut

DIVISION OF ASSOCIATED SPRING CORPORATION



SCRAP

... MARKET ACTIVITIES AND QUOTATION TRENDS

Movement Hit by "One Grade" Ruling

Pittsburgh

... Scrap is being delayed in reaching steel companies, urgently needed freight cars are being held up and general confusion reigns here as a result of OPA's recent ruling that only one grade of scrap may be placed in a vehicle if a ceiling price of that grade is to be obtained. This amendment

Story on scrapping of auto dies appears on page 161.

says that if the scrap is mixed, the price charge must be \$2.50 a gross ton below the ceiling price applicable for the lowest priced grade on the shipment.

While OPA apparently sought to prevent the possibility of unprepared scrap being sold at prepared prices, authorities here say

the ruling more or less will demoralize operations of small dealers. Some of the latter would have to hold a freight car for a week or two weeks or more in order to get enough of a single grade to make a shipment. This in turn keeps scrap from reaching the open hearth and makes more difficult the carrying on of scrap collections and preparations.

Another factor which is slowing up scrap collections especially in graveyards and on farms is the failure of OPA to name a specific price ceiling for automobile scrap "on the hoof" and farm scrap as it is encountered. Some steel companies have paid as high as \$14 a gross ton for old automobiles, which leads to some conjecture on the successful methods used which would allow such scrap to be prepared and delivered to the furnaces at a maximum of \$20 a ton. Furthermore it is said the pub-

Scrap Consumption At Peak in March

... According to the estimate of the Institute of Scrap Iron & Steel, consumption of scrap in March at 4,840,000 gross tons was an all-time high record. This compares with the melting of 4,276,000 tons in February and 4,662,000 tons in March, 1941, the previous record. In the first three months of 1942 consumption of scrap has totaled 13,706,000 gross tons contrasted with 13,112,000 tons in the first quarter of 1941.

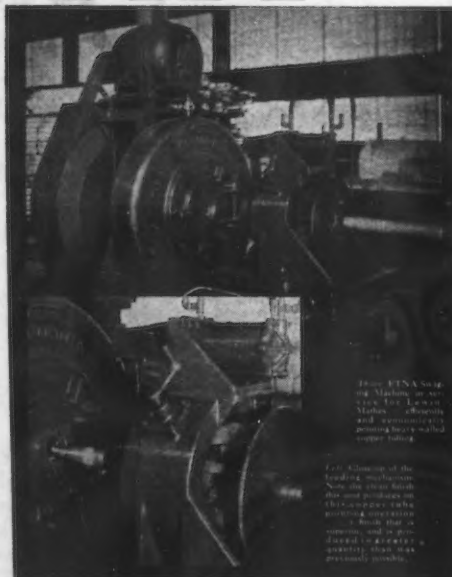
licity on maximum scrap prices with little or no attention to publicity being given the work and expense necessary to take old cars and farm scrap and put them into proper shape for steel furnace consumption has led many graveyard owners and farmers to believe that prices offered them are ridiculously low. Scrap authorities here believe that a long step forward would be made if the government set a price on old autos and farm scrap. They must do it anyway if the scrap is commandeered.

LEWIN-MATHES *Got the right answer at* **ETNA**

They had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so Lewin-Mathes did the safe and logical thing—they put their swaging job up to Etna.

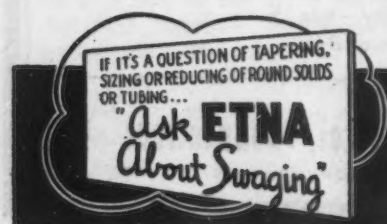
The answer to that problem is illustrated on this page. It's a modern Etna Swaging Machine that points *more* copper tubes per hour in less time at less cost. If you have a problem involving tapering or reducing tubing and solid rounds—ask Etna about it.

Etna has the swaging machines from 3/8" to 4" and the experience to help you get the most out of this type of machine.



From Etna Swaging Machine, as used by Lewin-Mathes, shown and demonstrated pointing heavy-walled copper tubing.

Left: Etna's swaging machine, shown in operation, is a modern machine that is designed to produce a quality product that is superior to that of any other machine.



ETNA
MACHINE COMPANY
TOLEDO OHIO

Temporary Injunction Restrains 6 Steel Firms

Washington

... A temporary injunction restraining six steel companies and an iron and steel scrap broker from buying and selling scrap above ceiling prices was obtained last Friday by OPA in Federal District Court at Kansas City. The companies proceeded against are: The Security Mfg. Co.; Leeds Material Co.; Alabama Pipe Co.; American Brake Shoe & Foundry Co.; Sheffield Steel Corp., all of Kansas City; Weirton Steel Co. of Weirton, W. Va., and the Sonken-Galamba Corp., scrap brokers of Kansas City, Kansas.

The companies were further enjoined from distributing and collecting commissions likewise prohibited under the iron and steel scrap schedule No. 4.

Transit Company Sells Bridges East Liverpool, Ohio

•••The Valley Motor Transit Co. has sold five steel bridges to Samuel Caplan for wrecking purposes. The bridges had been abandoned two years ago and include a viaduct here and smaller spans in western Pennsylvania and eastern Ohio.

PITTSBURGH—Scrap movement here has slowed up recently with part of the condition ascribed to recent amendments which force the loading of a single grade of scrap in one vehicle. Small dealers must wait until they have carloads. Local brokers are attempting to concentrate shipments to three open hearth furnaces in the district which have been down for lack of material but in view of overall supplies and the number of allocations this may be only temporary relief.

PHILADELPHIA—Except for cast grades, the scrap supply in the Eastern Pennsylvania area continues to hold up well. Quality has taken a definite turn for the worse. Inclusion of tin in bundles is not responsible. The presence of tin cans in, say, No. 2 bundles will cause rejection of the entire car. The trouble is believed to lie in the increased collection of household scrap and the difficulty of properly classifying it.

CLEVELAND—OPA inspectors are due at mills here to inspect incoming scrap shipments, as they have done elsewhere. A scrap observer points out there is no provision in the scrap schedule for roll scale, which is usable by many consumers. There is a fair amount of this available. The overall prospect for late 1942 and early 1943 continues clouded, as the scrap which BIC and Ordnance Department representatives are able to bring onto the market, is largely "non-recurring." The dealer scrap situation may become increasingly severe for the duration.

ST. LOUIS—Industries are slowly building up scrap reserves in some instances. Efforts of melters are directed toward making provision for next winter, as fixed prices eliminate incentive for dealers to accumulate. Auto graveyards are yielding considerably more scrap than heretofore under the government threat to take over unless material is forthcoming.

CHICAGO—Federal court granted the temporary injunction sought by OPA against more than a score of scrap dealers and brokers to enforce compliance with scrap regulations. Northwestern Steel & Wire Co., only mill named in the case, accepted a consent decree.

BOSTON—Washington representatives are checking yards on the wage and hour law. The ruling that but one grade of scrap can be shipped in a car has caused slight confusion.

BUFFALO—If the present improved movement of scrap is maintained here during the summer months, local steel plants and foundries probably will be

able to accumulate sufficient quantities of materials to help carry them through the coming fall and winter at virtual capacity rates. At the same time, Paul F. McLaughlin, senior commercial specialist for the WPB, declared it may be necessary to take men from war training courses in schools to put into effect a program calling for a complete turnover of scrap metal lying in the numerous local auto graveyards. Four lake boats from the upper lakes recently unloaded about 20,000 tons of assorted scrap at the Bethlehem Steel Lackawanna docks.

Clinic Hears Plea for More, Better Scrap

Cleveland

•••Representatives of steel mills and foundries appealed to scrap dealers for more and better scrap now, during the national salvage clinic of WPB and the Ordnance Department, held there last week before 400 scrap dealers, Federal officials and scrap consumers. Keynote addresses were made by Charles M. White, vice-president, Republic Steel Corp.; Walter L. Seelbach, executive head, Forest City Foundries, and Edwin Barringer, president, Iron & Steel Scrap Institute.

"We have had continuously since last November one or two openhearth furnaces idle for lack of scrap," said Mr. White. He added that scrap is needed now, since additional pig iron capacity which will become available during 1943 will be able to substantially offset the scrap shortage.

Mr. Seelbach appealed that scrap be properly segregated, adding that enough must be available to permit foundries to produce at least 12,000,000 tons of good gray iron castings in 1942. He said there is ample capacity in the gray iron foundry industry to make high tensile strength gray iron, thereby relieving the bottleneck in steel casting production facilities, provided foundrymen are able to secure scrap.

Mr. Seelbach's plea for segregation was answered by Sam Ur-dang, chairman of the Northern Ohio Chapter of the scrap institute, who stated the classification of scrap must start at the source, and producers should keep each lot separately.



• Tough Alloy, Steel Body — High Speed, Steel Edge — Patented Electric Weld

If you want uninterrupted production . . . use these patented composite blades that cannot break . . . that stand up to the highest speed and heaviest feed any hack saw can attain . . . the positively unbreakable hack saw blades with the longest cutting edge—High Speed Steel.

Sold by Industrial Distributors everywhere

ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
 5700 BLOOMINGDALE AVENUE CHICAGO, U. S. A.
 Eastern Sales Office: 225 Lafayette St., New York

SCRAP PRICES

(All the prices given below are per gross tons and are basing point prices from which shipping point prices and consumer's delivered prices are to be computed)

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

	BASIC OPEN HEARTH GRADES (No. 1 Heavy Melting; No. 1 Hydr. Com- pressed Black Sheets; No. 2 Heavy Melting; Dealers' No. 1 Bundles; Dealers' No. 2 Bundles; No. 1 Busheling)			BLAST FURNACE GRADES (Mixed Borings and Turnings; Shovelling Turnings; No. 2 Busheling; Cast Iron Borings)			ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES											
	Machine Shop Turnings	Alloy free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles	Low Phos.			Heavy Structural and Plate			Cut Auto. Steel Scrap							
					Billet, Bloom, Forge Crops	Bar Crops and Smaller	Punch- ings and Plate	3 ft. and Under	2 ft. and Under	1 ft. and Under	3 ft. and Under	2 ft. and Under	1 ft. and Under					
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton.....	\$20.00	\$16.00	\$16.00	\$25.00	\$22.50	\$22.50	\$21.00	\$21.50	\$22.00	\$20.00	\$20.50	\$21.00	\$18.00	\$19.50	\$21.00			
Cleveland, Middletown, Cincinnati, Portsmouth.....	19.50	15.50	15.50	24.50	22.00	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50			
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Pt....	18.75	14.75	14.75	23.75	21.25	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75			
Ashland, Ky.....	19.50	15.50	15.50	24.50	22.00	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50			
Buffalo, N. Y.....	19.25	15.25	15.25	24.25	21.75	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25			
Bethlehem, Pa.; Kokomo, Ind.....	18.25	14.25	14.25	23.25	20.75	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25			
Duluth, Minn.....	18.00	14.00	14.00	23.00	20.50	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00			
Detroit, Mich.....	17.85	13.85	13.85	22.85	20.35	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85			
Toledo, Ohio.....		13.85	13.85															
St. Louis, Mo.....	17.50	13.50	13.50	22.50	20.00	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50			
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburg, Cal.; San Francisco	17.00	13.00	13.00	22.00	19.50	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00			
Minneapolis, Colo.....	16.50	12.50	12.50	21.50	19.00	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50			
Seattle, Wash.....	14.50	10.50	10.50	19.50	17.00	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50			
Portland, Ore.....					15.50	15.50	14.00	14.50	15.00	13.00	13.50	14.00	11.00	12.50	14.00			

BUNDLES consisting exclusively of tin coated material and compressed into charging box size, are \$4 per gross ton below No. 2 dealers' bundles. Bundles containing tin coated material but not composed exclusively of such material (outlawed by order M-24-b) are \$8 below No. 2 dealers' bundles.

PITTSBURGH basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport. Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakland, Cal.

MAXIMUM prices of inferior grades shall continue to bear same differential below corresponding grades as existed during the period Sept. 1, 1940, to Jan. 31, 1941. Superior grades cannot be sold at a premium without approval of OPA. Special preparation charges in excess of the above prices are banned. Whenever any electric furnace or foundry grades are purchased for open hearth or blast furnace use, prices may not exceed the prices above for the corresponding open hearth grades.

MAXIMUM SHIPPING POINT PRICE—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad car or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. Published dock charges prevail, or if unpublished 75c. per ton must be included as part of the deduction.* Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus lowest switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.* For exceptions see official order.

*At Memphis deduct 50c.; Great Lakes ports \$1; New England \$1.25.

REMOTE SCRAP: Defined as all grades of scrap listed in table above located in North Dakota, South Dakota, Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon and Utah. The delivered price of remote scrap may exceed by more than \$1, but not more than \$5, the price at the basing point nearest the consumer's plant, provided detailed statement under oath is furnished OPA. Where delivered price would exceed by more than \$5 the price at basing point nearest consumer, user must apply to OPA for permission to absorb the additional charges. For exceptions see official order.

UNPREPARED SCRAP: The maximum prices established hereinabove are maximum prices for prepared scrap. For unprepared scrap, maximum prices shall be \$2.50 less than the maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge \$2.50 per ton on consumer-owned unprepared remote scrap (see order).

Where more than one grade of scrap is included in a shipment, the shipment is to be classified as unprepared scrap and shall be priced at \$2.50 per gross ton below the maximum price applicable to the lowest grade in the shipment.

Where scrap is to undergo preparation prior to its arrival at the point of delivery, such scrap is not at its shipping point, as that phrase is defined above, until after preparation has been completed.

CAST IRON BORINGS: (No more than 0.5 per cent oil content; for chemical use), add \$5 to price of cast iron borings.

UNPREPARED CAST IRON SCRAP—Except for heavy breakable cast, unprepared scrap is given a price ceiling of \$2.50 per ton less than the maximum prices for the corresponding grade of prepared cast iron scrap. Where scrap is to undergo preparation prior to arrival at the point of delivery, such scrap is not considered at shipping point until preparation is completed.

Consumers of cast scrap may pay the shipping point price plus established charge for transporting the scrap to their plants. In the case of deliveries by truck, the cast scrap buyer must obtain from the seller a certification, made out to OPA, of the shipping point, transportation charges and details of the sale.

RAILROAD SCRAP

(Per gross ton, delivered consumers' plants located on line.)

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Re-rolling	Scrap Rails		
				3 ft. and Under	2 ft. and Under	18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown.....	\$20.50	\$21.50	\$23.00	\$23.50	\$23.75	\$24.00
Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown....	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington, Birmingham, Los Angeles, San Francisco.....	19.75	20.75	22.25	22.75	23.00	23.25
Buffalo.....	20.25	21.25	22.75	23.25	23.50	23.75
Detroit.....	18.85	19.85	21.35	21.85	22.10	22.35
Duluth.....	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.....	17.00	18.00	19.50	20.00	20.25	20.50
Kokomo, Ind.....	19.25	20.25	21.75	22.25	22.50	22.75
Seattle.....	15.50	16.50	18.00	18.50	18.75	19.00
St. Louis.....	18.50	19.50	21.00	21.50	21.75	22.00

CAST IRON SCRAP

(Other Than Railroad Scrap)

	Group A	Group B	Group C
No. 1 machinery cast, drop broken, 150 lbs.			
No. 1 cupola cast.....	\$18.00	\$19.00	\$20.00
and under.....	18.00	19.00	20.00
Clean auto cast.....	18.00	19.00	20.00
Unstripped motor blocks.....	17.50	18.50	19.50
Stove Plate.....	17.00	18.00	19.00
Heavy Breakable Cast.....	15.50	16.50	17.50
Charging box size cast.....	17.00	18.00	19.00
Misc. Malleable.....	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B; switch district of Kansas City, Kan., Mo.

... Comparison of Prices

(Advances Over Past Week in **Heavy Type**; Declines in *Italics*. Prices Are F.O.B. Major Basing Points)

Flat Rolled Steel: (Cents Per Lb.)	1942 May 5,	1942 Apr. 28,	1942 Apr. 7,	1941 May 6,
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terne Plate: (Dollars Per Base Box)	1942 May 5,	1942 Apr. 28,	1942 Apr. 7,	1941 May 6,
Tin plate	\$5.00	\$5.00	\$5.00	\$5.00
Manufacturing ternes ...	4.30	4.30	4.30	4.30

Bars and Shapes: (Cents Per Lb.)	1942 May 5,	1942 Apr. 28,	1942 Apr. 7,	1941 May 6,
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00

Wire and Wire Products: (Cents Per Lb.)	1942 May 5,	1942 Apr. 28,	1942 Apr. 7,	1941 May 6,
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55

Rails: (Dollars Per Gross Ton)	1942 May 5,	1942 Apr. 28,	1942 Apr. 7,	1941 May 6,
Heavy rails	\$40.00	\$40.00	\$40.00	\$40.00
Light rails	40.00	40.00	40.00	40.00

Semi-Finished Steel: (Dollars Per Gross Ton)	1942 May 5,	1942 Apr. 28,	1942 Apr. 7,	1941 May 6,
Rerolling billets	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, bars	54.00	54.00	54.00	54.00

Wire Rods and Skelp: (Cents Per Lb.)	1942 May 5,	1942 Apr. 28,	1942 Apr. 7,	1941 May 6,
Wire rods	2.00	2.00	2.00	2.00
Skelp (grv'd)	1.90	1.90	1.90	1.90

Pig Iron: (Per Gross Ton)	May 5, 1942	Apr. 28, 1942	Apr. 7, 1942	May 6, 1941
No. 2 fdy., Philadelphia...	\$25.89	\$25.89	\$25.89	\$25.84
No. 2, Valley furnace....	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti...	24.68	24.68	24.68	24.06
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa...	25.34	25.34	25.34	25.34
Basic, Valley furnace ...	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago...	31.34	31.34	31.34	30.34
Ferromanganese†	120.00	120.00	120.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

Scrap: (Per Gross Ton)	May 5, 1942	Apr. 28, 1942	Apr. 7, 1942	May 6, 1941
Heavy melting steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1, hy. comp sheet, Det.	17.85	17.85	17.85	....
Low phos. plate, Young'n	22.50	22.50	22.50	....
No. 1 cast, Pittsburgh...	20.00	20.00	20.00	23.25
No. 1 cast, Philadelphia...	20.00	20.00	20.00	24.00
No. 1 cast, Ch'go*	20.00	20.00	20.00	22.60

*Changed to gross ton basis April 3, 1941.

Coke, Connellsville: (Per Net Ton at Oven)	May 5, 1942	Apr. 28, 1942	Apr. 7, 1942	May 6, 1941
Furnace coke, prompt ...	\$6.00	\$6.00	\$6.00	\$5.625
Foundry coke, prompt ...	6.875	6.875	6.875	6.25

Non-Ferrous Metals: (Cents per Lb. to Large Buyers)	May 5, 1942	Apr. 28, 1942	Apr. 7, 1942	May 6, 1941
Copper, electro., Conn.*	12.00	12.00	12.00	12.00
Copper, Lake, New York.	12.00	12.00	12.00	12.00
Tin (Straits), New York.	52.00	52.00	52.00	52.00
Zinc, East St. Louis....	8.25	8.25	8.25	7.25
Lead, St. Louis	6.35	6.35	6.35	5.70
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

*Mine producers only.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 174 to 182 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

... Composite Prices

FINISHED STEEL		PIG IRON		SCRAP METAL	
May 5, 1942	2.30467c. a Lb.....	.....\$23.61	a Gross Ton.....	.....\$19.17	a Gross Ton.....
One week ago	2.30467c. a Lb.....	.....\$23.61	a Gross Ton.....	.....\$19.17	a Gross Ton.....
One month ago	2.30467c. a Lb.....	.....\$23.61	a Gross Ton.....	.....\$19.17	a Gross Ton.....
One year ago	2.30467c. a Lb.....	.....\$23.61	a Gross Ton.....	.....\$19.17	a Gross Ton.....

	HIGH	Low
1942.....	2.30467c.,	2.30467c.,
1941.....	2.30467c.,	2.30467c.,
1940.....	2.30467c., Jan. 2	2.24107c., Apr. 16
1939.....	2.35367c., Jan. 3	2.26689c., May 16
1938.....	2.58414c., Jan. 4	2.27207c., Oct. 18
1937.....	2.58414c., Mar. 9	2.32263c., Jan. 4
1936.....	2.32263c., Dec. 28	2.05200c., Mar. 10
1935.....	2.07642c., Oct. 1	2.06492c., Jan. 8
1934.....	2.15367c., Apr. 24	1.95757c., Jan. 2
1933.....	1.95578c., Oct. 3	1.75836c., May 2
1932.....	1.89196c., July 5	1.83901c., Mar. 1
1931.....	1.99629c., Jan. 13	1.86586c., Dec. 29
1930.....	2.25488c., Jan. 7	1.97319c., Dec. 9
1929.....	2.31773c., May 28	2.26498c., Oct. 29

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 75 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

	HIGH	LOW
23.61, Mar. 20	\$23.61	\$23.45, Jan. 2
23.45, Dec. 23	22.61, Jan. 2	
22.61, Sept. 19	20.61, Sept. 12	
23.25, June 21	19.61, July 6	
23.25, Mar. 9	20.25, Feb. 16	
19.74, Nov. 24	18.73, Aug. 11	
18.84, Nov. 5	17.83, May 14	
17.90, May 1	16.90, Jan. 27	
16.90, Dec. 5	13.56, Jan. 3	
14.81, Jan. 5	13.56, Dec. 6	
15.90, Jan. 6	14.79, Dec. 15	
18.21, Jan. 7	15.90, Dec. 16	
18.71, May 14	18.21, Dec. 17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	LOW
\$22.00, Jan. 7	\$19.17	\$19.17, Apr. 10
21.83, Dec. 30	16.04, Apr. 9	
22.50, Oct. 3	14.08, May 16	
15.00, Nov. 22	11.00, June 7	
21.92, Mar. 30	12.92, Nov. 10	
17.75, Dec. 21	12.67, June 9	
13.42, Dec. 10	10.33, Apr. 29	
13.00, Mar. 13	9.50, Sept. 25	
12.25, Aug. 8	6.75, Jan. 3	
8.50, Jan. 12	6.43, July 5	
11.33, Jan. 6	8.50, Sept. 29	
15.00, Feb. 18	11.25, Dec. 9	
17.58, Jan. 29	14.08, Dec. 3	

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

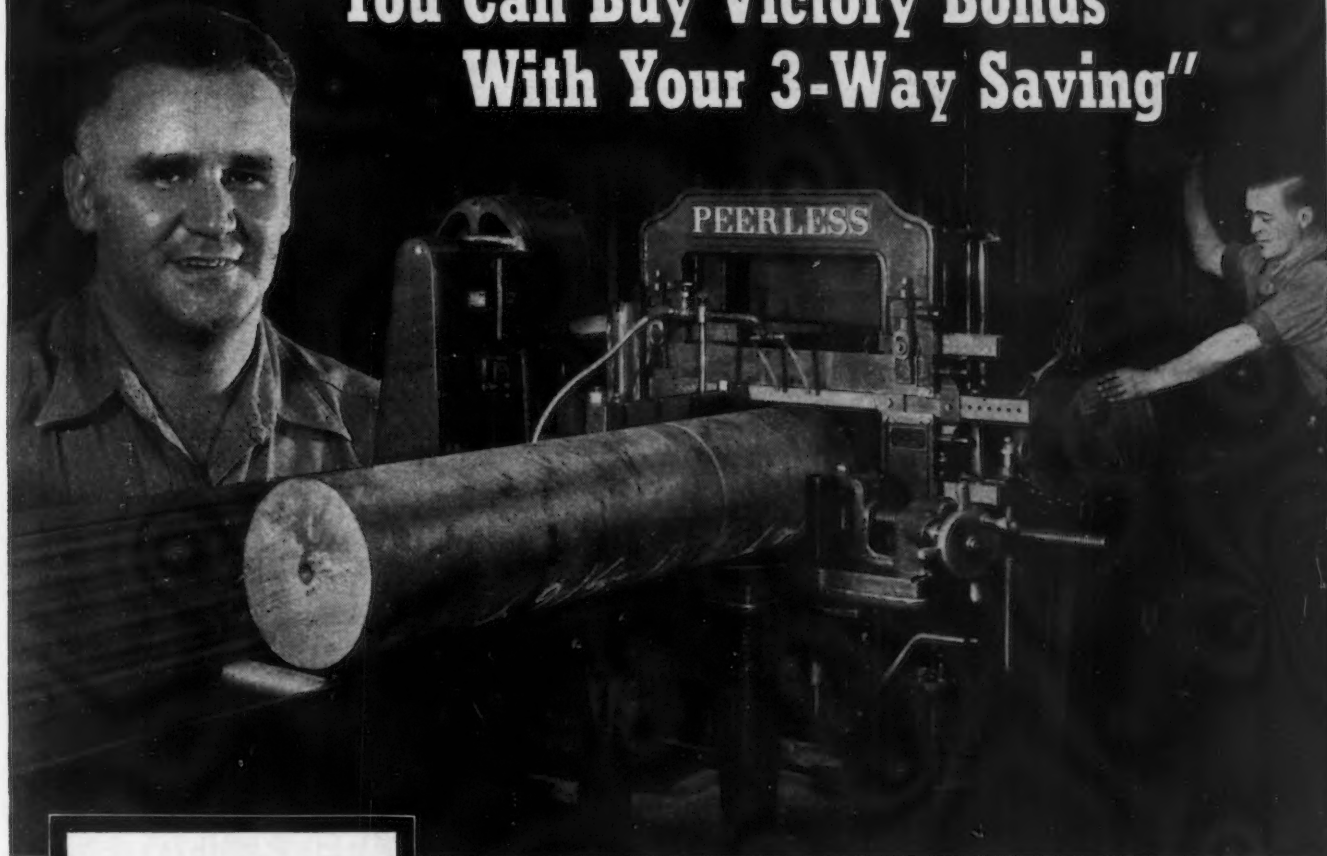
Prices of Finished Iron and Steel . . .

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product	DELIVERED TO															
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacifi- c Ports, Cars	10	Detroit	New York	Phila- delphia
SHEETS																
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢		2.22¢	2.35¢	2.28¢
Cold rolled ¹	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢		3.17¢	3.41¢	3.39¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢			3.75¢	3.68¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢		3.47¢	3.73¢	3.69¢
Long ternes ²	3.80¢		3.80¢									4.55¢			4.18¢	4.14¢
STRIP																
Hot rolled ³	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢		2.22¢	2.48¢	
Cold rolled ⁴	2.80¢	2.90¢		2.80¢			2.80¢		(Worcester = 3.00¢)					2.92¢	3.18¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢								2.58¢	
Commodity C-R	2.95¢			2.95¢			2.95¢		(Worcester = 3.35¢)					3.07¢	3.33¢	
TIN PLATE																
Standard cokes, base box	\$5.00	\$5.00	\$5.00						\$5.10						5.38¢	5.34¢
BLACK PLATE																
29 gage ⁵	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢				3.39¢
TERNES, M'FG.																
Special coated, base box	\$4.30	\$4.30	\$4.30						\$4.40							
BAR																
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			(Duluth = 2.25¢)		2.52¢	2.80¢		2.27¢	2.51¢	2.49¢
Rail steel ⁶	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.52¢	2.80¢				
Reinforcing (billet) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.52¢	2.55¢		2.27¢	2.40¢	
Reinforcing (rail) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.52¢	2.55¢				2.49¢
Cold finished ⁸	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)						3.01¢	2.99¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢			(Bethlehem, Massillon, Canton = 2.70¢)					2.82¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢								3.47¢		
PLATES																
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢ ⁽¹¹⁾		2.47¢	2.65¢		2.27¢	2.30¢	2.155¢
Wrought iron	3.80¢															
Floor plates	3.35¢	3.35¢									3.72¢	4.00¢			3.73¢	3.69¢
Alloy	3.50¢	3.50¢							(Coatesville = 3.50¢)		3.97¢	4.15¢			3.71¢	3.60¢
SHAPES																
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			(Bethlehem = 2.10¢)		2.47¢	2.75¢			2.28¢	2.22¢
SPRING STEEL, C-R																
0.28 to 0.50 Carbon	2.80¢			2.80¢					(Worcester = 3.00¢)							
0.51 to 0.75 Carbon	4.30¢			4.30¢					(Worcester = 4.50¢)							
0.76 to 1.00 Carbon	6.15¢			6.15¢					(Worcester = 6.35¢)							
1.01 to 1.25 Carbon	8.35¢			8.35¢					(Worcester = 8.55¢)							
WIRE⁹																
Bright ¹⁰	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)			3.10¢				2.94¢
Galvanized																
	add proper size extra and galvanized extra to bright wire base, above.															
Spring (High Carbon)	3.20¢	3.20¢		3.20¢					(Worcester = 3.30¢)			3.70¢				3.54¢
PILING																
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢				2.74¢
IRON BARS¹²																
Wrought single refined	4.40¢															
Wrought double refined	5.40¢															

¹ Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. ² Unassorted 8-lb. coating. ³ Widths up to 12 in. ⁴ Carbon 0.25 per cent and less. ⁵ Applies to certain width and length limitations. ⁶ For merchant trade. ⁷ Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. ⁸ Also shafting. For quantities of 20,000 to 39,999 lb. ⁹ Carload lot to manufacturing trade. ¹⁰ These prices do not apply if the customary means of transportation (rail and water) are not used. ¹¹ Ship plates only. ¹² Common iron bars quoted at 2.15c. by Terre Haute, Ind. producer. ¹³ Boxed. ¹⁴ Portland and Seattle price, San Francisco price is 2.50c. ¹⁵ This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

"You Can Buy Victory Bonds With Your 3-Way Saving"



PERFORMANCE REPORT "N"

Sawing 12 3/4" diesel crosshead shafts to minute accuracy. 2000 Sq. In. are cut on a single blade. The shafts are used in 3600 H.P., Diesel Engines for the Navy.

Peerless Saws Save TIME • METAL • BLADES

This three-way saving, on hundreds of hurry-up government contracts, is helping employer and employee save more for Bonds and Stamps. Blade savings count up fast when the metal is SAWED with a High Duty Peerless. A cushioned, hydraulic control to the Four-Sided Saw-Frame smoothly applies just the right feed and speed at the right time.

Fast cutting is practical. Accurate cutting is sure.

Saving time and metal is a cinch when the first and final cut is made on a Peerless.

Less metal removed by the thin, cool-cutting blade means — Less Blade Wear . . . Less Cutting Time . . . Less Haul-Back Tonnage . . . and Less Re-Roll Expense for the Steel Mill.

You, too, can save more by SAWING with a Peerless. Send Samples of your toughest materials. We'll cut them and tell you how.

PEERLESS MACHINE COMPANY • RACINE, WISCONSIN

Peerless
METAL SAWING MACHINES

PEERLESS MACHINE COMPANY, Dept. IA-542, Racine, Wisconsin

Mail cutting time estimate for _____

- ☐ Mail catalog on Hydraulic type Saw for High Production Cutting
- ☐ Mail catalog covering Vertical type used for Die Block Work
- ☐ Mail catalog on Mechanical type Saw for production cutting
- ☐ Mail catalog on general utility and maintenance Saws

Company _____

Individual _____

Street _____

City _____

State _____

FAST, ACCURATE CUTTING DEMANDS POSITIVE BLADE CONTROL

PRICES

SEMI-FINISHED STEEL

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2.25 higher; f.o.b. Duluth, billets only, \$2 higher.

Rerolling Per Gross Ton \$34.00
Forging quality 40.00

Shell Steel

3 in. to 12 in. Per Gross Ton \$52.00
12 in. to 18 in. 54.00
18 in. and over 56.00
Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.
Prices delivered Detroit are \$2.25 higher.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Open hearth or bessemer Per Gross Ton \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Grooved, universal and sheared Per Lb. 1.90c

Wire Rods

(No. 5 to 9/32 in.) Per Lb.
Pittsburgh, Chicago, Cleveland 2.00c
Worcester, Mass. 2.10c
Birmingham 2.00c
San Francisco 2.50c
Galveston 2.25c

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

Alloy Steel Blooms, Billets and Slabs

Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem Per Gross Ton \$54.00

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

High speed Base per Lb. 67c
Straight molybdenum 54c
Tungsten-molybdenum 57½c
High-carbon-chromium 43c
Oil hardening 24c
Special carbon 22c
Extra carbon 18c
Regular carbon 14c

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices are delivered quotations per gross ton computed on the basis of the official maxima.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorous	Charcoal
Boston††	\$25.53	\$25.03	\$26.53	\$26.03	.....	.....
Brooklyn	27.65	.....	.....	28.15	.....	.....
Jersey City	26.62	26.12	27.62	27.12	.....	.....
Philadelphia	25.89	25.39	26.89	26.39	.....	.....
Bethlehem, Pa.	\$25.00	\$24.50	\$26.00	\$25.50	.....	.....
Everett, Mass.††	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	25.00	24.50	26.00	25.50	\$29.50	.....
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	26.00	25.50	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati	24.68	24.68	.....	25.18	.....	.....
Canton, Ohio	25.47	24.97	25.97	25.47	.....	.....
Mansfield, Ohio	26.06	25.56	26.56	26.06	.....	.....
St. Louis	24.53	24.05	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	.....	\$31.34
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	.....	.....
Hamilton, Ohio	24.00	23.50	24.50	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown*	24.00	23.50	24.50	24.00	.....	.....
Detroit	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	\$28.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	33.00
St. Paul	26.76	.....	27.26	26.76	.....	.....
Duluth	24.50	.....	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	27.25	.....	.....	.....	.....	.....
San Francisco	27.25	.....	.....	.....	.....	.....
Seattle	27.25	.....	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....	.....
Montreal	27.50	27.50	.....	28.00	.....	.....
Toronto	25.50	25.50	.....	26.00	.....	.....

GRAY FORGE IRON

Valley or Pittsburgh furnace \$23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at \$1 per gross ton above maximum prices.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade (1.75 per cent to 2.25 per cent).

Phosphorous Differential: Basing point prices are subject to a reduction of 88c. per ton for phosphorous content of 0.70 per cent and over.

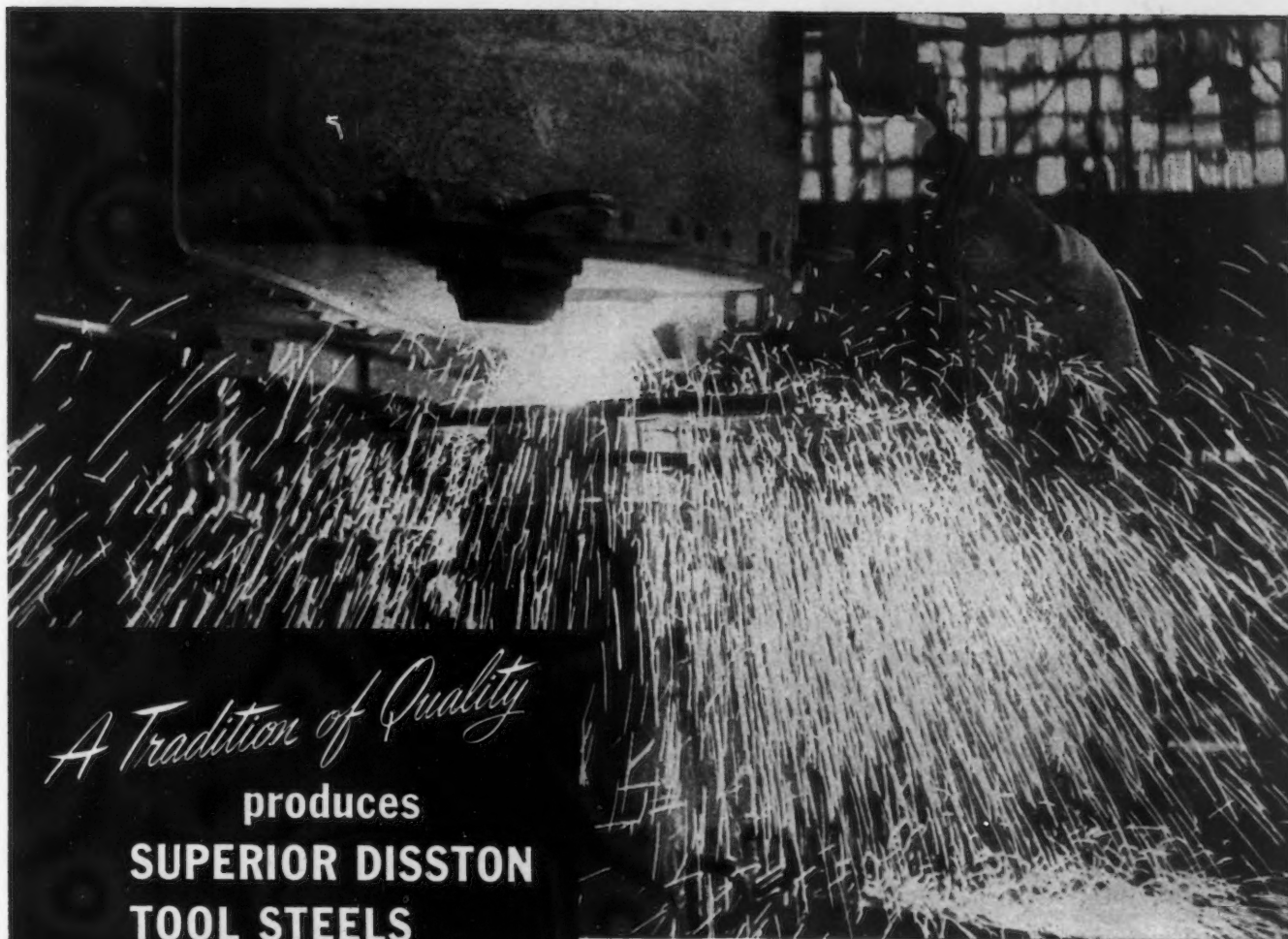
†Price shown is for low-phosphorous iron; high-phosphorous sells for \$28.50 at the furnace.

Manganese Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

WAREHOUSE PRICES (Delivered Metropolitan areas, per 100 lb. See THE IRON AGE, Dec. 25, 1941, page 88, for details of OPA Price Schedule No. 49, covering steel resale prices. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. city prices are used in conformance with Schedule 49.)

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St. Paul	Milwaukee	Los Angeles
Sheets, hot rolled	\$3.35	\$3.25	\$3.35	\$3.55	\$3.58	\$3.43	\$3.25	\$3.71	\$3.45	\$3.39	\$3.50	\$3.38	\$4.95
Sheets, cold rolled	.....	4.10	4.05	4.05	4.60	4.30	4.30	4.68	.....	4.24	4.35	4.23	7.50
Sheets, galvanized	4.65	4.85	4.62	5.05	5.00	4.84	4.75	5.11	4.75	4.99	5.00	4.98	5.95
Strip, hot rolled	3.60	3.60	3.50	3.51	3.96	3.68	3.82	4.06	3.70	3.74	3.85	3.73	4.90
Strip, cold rolled	3.20	3.50	3.20	3.31	3.51	3.40	3.52	3.46	.....	3.61	3.83	3.54	.....
Plates	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.55	3.69	3.80	3.68	4.90
Structural shapes	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.60
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	4.35
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.48	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300	7.45	7.35	7.55	7.31	7.60	7.67	7.35	7.75	.....	7.72	7.45	7.58	9.55
Bars, ht. rld. SAE 3100	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	.....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300	8.40	8.40	8.40	8.56	8.84	8.70	8.40	8.88	.....	8.77	8.84	8.63	10.55
Bars, cd. drn. SAE 3100	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	.....	7.12	7.44	6.98	9.55

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb., cold rolled strips, 0.0971 in. thick; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., cold rolled strip 0.095 in. and lighter; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, \$3.43. †Los Angeles prices reflect special provisions of Amendment No. 2 to OPA Price Schedule No. 49.



A Tradition of Quality
produces
**SUPERIOR DISSTON
TOOL STEELS**

Disston achievements in fine tool steel manufacture extend over 87 years—back to the first crucible saw steel ever made in America, in 1855.

Out of this wealth of experience the Disston plants today are producing the finest tool steels in their history. Present practice, with modern electric furnaces, includes the use of the purest obtainable materials—the careful segregation of scrap by expert metallurgists—the employment of shallow ladles and the smallest molds for ideal ingot reduction.

At Disston, many special properties can be developed by accurate metallurgical and chemical controls, which hold operations within very close limits. Disston alloy and carbon steels with predetermined grain size and extraordinary soundness and cleanliness can be made to precise specifications.

One of such superior Disston Steels is Mansil—a deep-hardening, non-deforming, uniform die steel with good machinability—used for intricate

tools, and wherever varied cross sections must be deeply hardened.

Expert service without obligation: Disston engineers and metallurgists will be glad to help you select the best tool steels for the jobs to be done . . . to get better service and longer life from each tool. And if you have not received your free copy of the illustrated 73-page book, "Disston Tool Steels," write today to Henry Disston & Sons, 519 Tacony, Philadelphia, Pa., U. S. A.



FREE DISSTON CONSERVATION CONTROL INSTRUCTION CARDS

These cards are part of the Disston Conservation Control Plan to save vital time and materials in war time production. There are six cards on Tool Steels—supplied without charge to any plant, whether a user of Disston products or not. Write today for complete information.

Oil-Hardening Tool Steel
WORKING INSTRUCTIONS
Do not heat steel above 1500° F. and do not temper below 1500° F. Hardening in oil or water before finishing.

CONSERVATION CONTROL CARD No. 42
Oil-Hardening Tool Steel
Time to obtain better results in working steel.

FAILURE	CAUSE	CORRECTION
Improper hardening		A correct grain size is essential for hardening. Heat to 1500° F. and hold for 1 hour. Then cool in oil or water. Do not reheat to 1500° F. after hardening.
Cracking		In case of essential hardening, the steel should be tempered at 1500° F. for 1 hour. Then cool in oil or water. Do not reheat to 1500° F. after hardening.
Corrosion and scale		Keep the hardened steel in a dry place. Do not store in a damp place. Do not store in contact with other materials.
Distortion		When surface cracks are visible, the steel should be retempered at 1500° F. for 1 hour. Then cool in oil or water. Do not reheat to 1500° F. after hardening.
Soft spots		Check the grain size. It should be 10-15. If the grain size is too large, the steel should be reheated to 1500° F. and held for 1 hour. Then cool in oil or water. Do not reheat to 1500° F. after hardening.

CONSERVATION • SERVES EVERYONE

PRICES

CORROSION AND HEAT- RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F. Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	35.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. on Field grade to and including Dynamo. Pacific ports, add 75c. on all grades.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, per
Package of 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	\$6.00	\$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and Carriage Bolts:

6 1/2 in., shorter and smaller	65 1/2
6 x 5/8 in., and shorter	63 1/2
6 in. by 3/4 to 1 in. and shorter	61
1 1/2 in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed: (Hexagon or Square)

1/2 in. and smaller	62
9/16 to 1 in. inclusive	59
1 1/4 to 1 1/2 in. inclusive	57
1 1/2 in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	62	64
1/2 in. and smaller	62	
1/2 in. through 1 in.	60	60
9/16 to 1 in.	59	
1 1/8 in. through 1 1/2 in.	57	58
1 1/2 in. and larger	56	

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose	71 and 10
Stove bolts in packages, with nuts attached	71
Stove bolts in bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York lots of 200 lb. or over.

Large Rivets

(1/2 in. and larger)

Base per 100 lb.

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham	\$3.75
--	--------

Small Rivets

(7/16 in. and smaller)

Per cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5
---	----------

Cap and Set Screws

Per cent Off List

Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	68
Milled studs	40
Flat head cap screws, listed sizes	30
Filister head cap, listed sizes	46

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

WIRE PRODUCTS

(To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg

Standard wire nails	\$2.55
Coated nails	2.55
Cutnails, carloads	3.85

Base per 100 Lb.

Annealed fence wire	\$3.05
Annealed galvanized fence wire	3.40

Base Column

Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barless wire	70

*15 1/2 gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

BOILER TUBES

Seamless Steel and Lap Weld Commercial
Boiler Tubes and Locomotive Tubes
Minimum Wall

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless	Lap	Weld.
	Cold	Hot	Hot
	Drawn	Rolled	Rolled
	\$	\$	\$
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2 1/2 in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3 1/2 in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District
and Lorain, Ohio, Mills
(F.o.b. Pittsburgh only on wrought pipe)

Base Price—\$200 Per Net Ton

Steel (Butt Weld)

	Black	Galv.
1/2 in.	63 1/2	51
3/4 in.	66 1/2	55
1 to 3 in.	68 1/2	57 1/2

Wrought Iron (Butt Weld)

1/2 in.	24	3 1/2
3/4 in.	30	10
1 and 1 1/4 in.	34	16
1 1/2 in.	38	18 1/2
2 in.	37 1/2	18

Steel (Lap Weld)

2 in.	61	49 1/2
2 1/2 and 3 in.	64	52 1/2
3 1/2 to 6 in.	66	54 1/2

Wrought Iron (Lap Weld)

2 in.	30 1/2	12
2 1/2 to 3 1/2 in.	31 1/2	14 1/2
4 in.	33 1/2	18
4 1/2 to 8 in.	32 1/2	17

Steel (Butt, extra strong, plain ends)

	Black	Galv.
1/2 in.	61 1/2	50 1/2
3/4 in.	65 1/2	54 1/2
1 to 3 in.	67	57

Wrought Iron (Same as Above)

1/2 in.	25	6
3/4 in.	31	12
1 to 2 in.	38	19 1/2

Steel (Lap, extra strong, plain ends)

2 in.	59	48 1/2
2 1/2 and 3 in.	63	52 1/2
3 1/2 to 6 in.	66 1/2	56

Wrought Iron (Same as Above)

2 in.	33 1/2	15 1/2
2 1/2 to 4 in.	39	22 1/2
4 1/2 to 6 in.	37 1/2	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld.

CAST IRON WATER PIPE

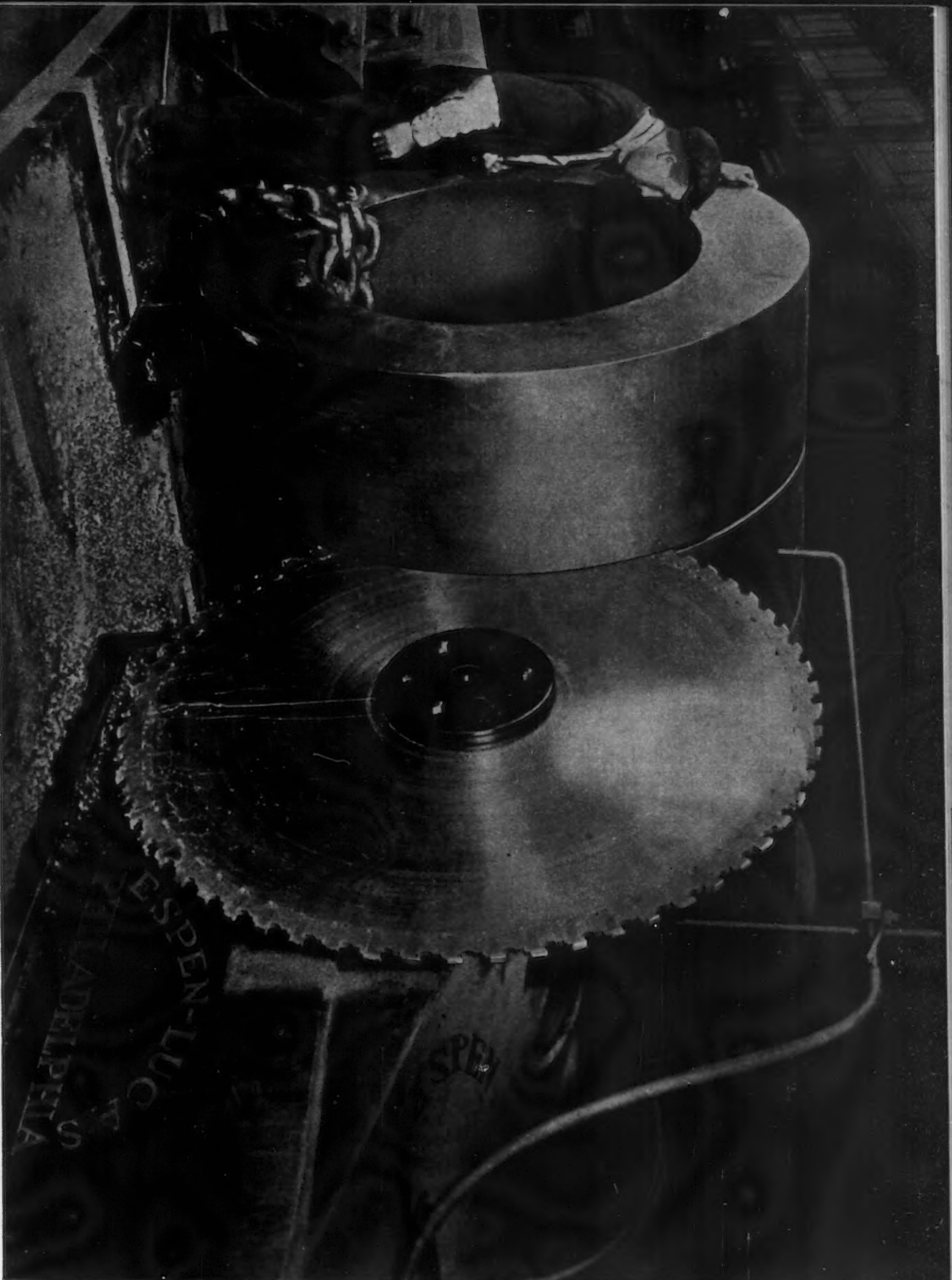
Per Net Ton

6-in. and larger, del'd Chicago	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham, \$53.30 delivered Chicago, \$59.40 at San Francisco and Los Angeles, and \$70.20 at Seattle.

FUEL OIL

No. 3, f.o.b. Bayonne, N. J.	5.20c.
No. 6, f.o.b. Bayonne, N. J.	4.285c.
No. 6 Bur. Stds., del'd Chicago	4.75c.
No. 3 distillate del'd Cleveland	6.50c.
No. 4 indus., del'd Cleveland	6.00c.
No. 5 indus. del'd Cleveland	5.25c.
No. 6 indus., del'd Cleveland	5.25c.



*Step-up
Production
with these
HEAVY-DUTY
METAL
SAWING
MACHINES*



The new design of these machines has resulted in a marked step-up in performance in line with today's demands. With hydraulic feeds and fast cutting speeds, these Espen-Lucas Machines will take heavy cuts—up cutting or down cutting in hard, tough alloy steels.

THE ESPEN-LUCAS MACHINE WORKS

FRONT AND GIRARD AVE., PHILADELPHIA, PA.

PRICES

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads).....\$135.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21%.....\$36.00
Domestic, 26 to 28%..... 49.50

Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)
50% (carload lots, bulk).....\$74.50
50% (ton lots, packed)..... 87.00
75% (carload lots, bulk).....135.00
75% (ton lots, packed).....151.00

Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 \$t)
F.o.b. Jackson, Ohio.....\$29.50*
Buffalo30.75*
For each addition 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorus or over.
*Official OPACS price established June 24.

Bessemer Ferrosilicon

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

Ferrochrome

(Per Lb., Contained Cr, Delivered Carlots, Lump Size, on Contract)
4 to 6 carbon.....13.00c.
2 carbon19.50c.
1 carbon20.50c.
0.10 carbon22.50c.
0.06 carbon23.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

(Per Gross Ton, Delivered, Lump Size, Bulk, on Contract)
3 carbon\$113.00*
2.50 carbon 118.00*
2 carbon 123.00*
1 carbon 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload..... \$2.00
Ferrotungsten, 100 lb. and less 2.25
Ferrovanadium, contract, per lb. contained V, del'd \$2.70 to \$2.90†
Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y., ton lots..... \$2.25†
Ferrocarbontitanium, 15-18 Ti, 7-8 C, f.o.b. furnace, carload, contract, net ton.....\$142.50
Ferrocarbontitanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload, contract, net ton.....\$157.50
Ferrophosphorus, electric or blast furnace material, carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage freight, equaled with Rockdale, Tenn., gross ton..... \$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage, freight equalized with Nashville, gross ton..... \$75.00
Ferromolybdenum, per lb. Mo, f.o.b. furnace 95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace..... 80c.
Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa.... 80c.
Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Langeloth, and Washington, Pa. 80c.

*Spot prices are \$5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores (51.50% Fe.)

(Delivered Lower Lake Ports)
Per Gross Ton
Old Range, bessemer, 51.50.... \$4.75
Old range, non-bessemer, 51.50. 4.60
Mesaba, bessemer, 51.50..... 4.60
Mesaba, non-bessemer, 51.50.... 4.45
High phosphorus, 51.50..... 4.35

Foreign Ores*

(C.A.F. Philadelphia or Baltimore, Exclusive of Duty)
Per Unit
African, 46-48 Mn.....66.5c. to 68c.
Indian, 48-50 Mn.68c. to 70c.

Brazilian, 46-48 Mn.....67c. to 68c.
Cuban, 51 Mn.81c.

Per Short Ton Unit
Tungsten, Chinese, Wolframite, duty paid, delivered.....\$24 to \$26
Tungsten, domestic scheelite, at mine\$24.00 to \$25.00
Chrome ore, lump, c.i.f. Atlantic Seaboard, per gross ton; South African (low grade)..\$28.00
Rhodesian, 45Nom.
Rhodesian, 48Nom.

*Importations no longer readily available. Prices shown are nominal.

COKE*

Furnace

Per Net Ton
†Connellsville, prompt\$6.00

Foundry

†Connellsville, prompt \$6.75 to \$7.00

*Maximum by-product coke prices established by OPA became effective Oct. 1, 1941. A complete schedule of the ceiling prices was published in THE IRON AGE, Sept. 25, p. 94B. Maximum beehive furnace coke prices established by OPA, Jan. 26. †F.O.B. oven.

By-product, Chicago\$12.25
By-product, New England.....\$13.75
By-product, Newark..\$12.40 to \$12.95
By-product, Philadelphia\$12.38
By-product, Cleveland \$12.30
By-product, Cincinnati\$11.75
By-product, Birmingham\$8.50†
By-product, St. Louis\$12.02
By-product, Buffalo\$12.50

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton.....\$40.00
Angle bars, 100 lb..... 2.70
(F.o.b. Basing Points) Per Gross Ton
Light rails (from billets).....\$40.00
Light rails (from rail steel)... 39.00
Base per Lb.
Cut spikes 3.00c.
Screw spikes 5.15c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast..... 2.30c.
Track bolts 4.75c.
Track bolts, heat treated, to railroads 5.00c.
Track bolts, jobbers discount.. 63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR

Fire Clay Brick Per Net Ton
Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail\$25.00
Domestic, f.o.b. Ohio River landing barges 25.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines 25.00
Foreign, 85% calcium fluoride, not over 5% Si, c.i.f. Atlantic ports, duty paid.....Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines....\$34.00
As above, in bags, f.o.b. same mines 36.40

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick Per 1000
Super-duty brick, St. Louis...\$64.60
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois 51.30
First quality, New Jersey..... 56.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois 46.55
Second quality, New Jersey... 51.00
No. 1, Ohio..... 43.00
Ground fire clay, net ton..... 7.60

Silica Brick

Pennsylvania\$51.30
Chicago District 58.90
Birmingham 51.30
Silica cement, net ton (Eastern) 9.00

Chrome Brick

Per Net Ton
Standard, f.o.b. Baltimore, Plymouth Meeting and Chester...\$54.00
Chemically bonded, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. 54.00

Magnesite Brick

Standard f.o.b. Baltimore and Chester\$76.00
Chemically bonded, f.o.b. Baltimore 65.00

Grain Magnesite

Domestic, f.o.b. Baltimore and Chester in sacks (carloads)..\$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) 22.00